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**BUREAU OF SHIPS GROUP  
TECHNICAL INSPECTION REPORT.**

366726

**⑥ OPERATION CROSSROADS.  
OVERALL SUMMARIES OF  
TARGET VESSELS.**

**TESTABLE. VOLUME 2 of 2.**

Classification (Cancelled) (Changed to **CONFIDENTIAL**)  
By Authority of **JOINT CHIEFS OF STAFF JCS 1705/30 DATED 18 APRIL 1949**  
by *John Culley, Maj* Date **JUN 28 1949**  
*AFSWP* VOLUME 2 OF 2

⑪ 1947  
⑫ iv.

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Defense Atomic Support Agency  
Washington, D. C. 20301

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Director  
Defense Atomic Support Agency  
Washington, D. C. 20301

## OVERALL SUMMARIES OF TARGET VESSELS

TEST ABLE

VOLUME 2 of 2

~~Classification (Cancelled)~~ (Changed to **CONFIDENTIAL**)  
By ~~Authority of~~ **JOINT CHIEFS OF STAFF JCS 1795/36 DATED 15 APRIL 1949**  
By *John G. Kelly, Maj.* Date **JUN 28 1949**  
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## INTRODUCTION

The report of damage on each target vessel contains an Overall Summary of damage for that vessel. In addition, for convenience and ready reference all Overall Summaries for Test Able have been bound in two volumes.

This volume, Volume 2 of 2 contains the Summaries of the following vessels:

- (a) Transports
- (b) Landing Craft
- (c) Concrete Craft

Classification (Cancelled) (Changed to **CONFIDENTIAL**)  
By Authority of **JOINT CHIEFS OF STAFF JCS 1795/38 DATED 15 APRIL 1949**  
By John H. Kelley, Major Date JUN 28 1949  
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Classification (Cancelled) (Changed to **CONFIDENTIAL**)  
By Authority of **JOINT CHIEFS OF STAFF JCS 1795/36 DATED 15 APRIL 1949**  
By *John D. Kelly, Major* Date **JUN 28 1949**  
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 By *John Cullen, Jr.* Date **JUN 28 1949**  
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By Authority of JOINT CHIEFS OF STAFF DATED 15 APRIL 1949  
By John D. Kelly, Maj. Date JUN 28 1949  
AFWP TECHNICAL INSPECTION REPORT

## OVERALL SUMMARY

### I. Target Condition After Test.

#### (a) Drafts After Test; List; General Areas of Flooding; Sources.

The GILLIAM was sunk. The time and manner of her sinking cannot be stated with certainty. The photo on page 12 shows the target array as seen on APQ #7 radar screen shortly before the burst. The arrow points to the position of the GILLIAM. In the photo on page 13, the GILLIAM appears to have broken into 3 pieces. The two extra images may be echos from large component units which were blown off the GILLIAM. The photo on page 14 shows the GILLIAM going down. She disappears from the radar screen 79 seconds after burst. Presumably the GILLIAM sinks shortly after the photo on page 15 was taken. No further image of the GILLIAM is obtained on the screen. A close scrutiny of the pictures taken by the 24 inch tower cameras on Bikini Island between 42 and 50 seconds after the blast reveal a darker spot in the general haze and smoke covering the array. (See photo on page 16). This spot orientates perfectly with the location of the stern of the GILLIAM just before the blast. Furthermore, it is shaped like the stern of an attack transport inclined upward at about 20 degrees. This spot persists for about four pictures or approximately twelve seconds before it disappears.

Based on this indication, the radar pictures and divers reports, it seems reasonable to assume that the GILLIAM sank by the bow in a little over one minute after the blast. Aerial photographs from PBM show no trace of the GILLIAM other than an oil slick at 0901:50 clock time.

Flooding undoubtedly started when the main deck and shell plating at the bow were opened by the blast.

USS GILLIAM (APA57)

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~~ATOMIC ENERGY ACT~~  
SPECIFIC RESTRICTED DATA CLEARANCE NOT REQUIRED  
USE MILITARY CLASSIFICATION STANDARDS



(b) Structural Damage.

The following information has been obtained from reports by divers and from observation of underwater photographs.

The ship is badly damaged. The damage extends the full length of the ship and from the top of the deckhouse down to the bilge. That part of the ship below the weather deck is largely in one piece. The ship is nearly upright. The stem, one bulkhead, and six to ten feet of the side shell plating are pushed to port and heading about fifty degrees from the centerline of the ship proper. The forward part of the ship is mashed down as though the blast acted like the hammer and the water an anvil. The upper deck at about frame 5 is only a few feet off the bottom. The upper deck aft of this point rises sharply until at frame 53, the after end of #1 hatch, it is approximately in its normal position.

The weather deck from frame 60 forward was stripped of all deck machinery, deck house, hatch coamings, foremast and other fittings. The sole fixed object noted on this deck was a port 40MM gun off which the shield had been stripped. The deck openings for the hatches and trunks were plainly seen. Around the number one cargo hatch the weather deck is about at its normal height above the bottom of the lagoon. From frame 60 aft the deck is impassable to divers and two attempts to land divers on the deck were abandoned after the conditions were reported as being unsafe. As viewed from the side and above, there is no recognizable part of the superstructure remaining or projecting above the level of the upper deck. The part of the ship that was formerly in this area now comprises the torn mass of wreckage to port of the vessel.

The shell on the starboard side above the waterline is missing to frame 30. Below the waterline it is crumpled and pushed into the ship. From frame 30 to 45 the upper part of the shell plating is peeled back and curled outboard. The lower part is wrinkled horizontally to the bilge keel. The port shell plating forward of frame 30 is opened out with the outside resting on the bottom of the lagoon. For a view of typically torn shell plating see photos on pages 17 thru 20 inclusive. The port side from frame 30 aft was not investigated. The starboard side of the vessel from

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USS GILLIAM (APA57)

frame 60 aft has a series of horizontal wrinkles as far down as the bilge keel. In this area there are locations where shell plates are missing, folded into the vessel, and curled outboard and back; but no large areas exhibit one type of behavior. The side as a whole is pushed to port giving the ship an appearance of having a list of about 30 degrees to port as viewed from the bottom of the lagoon. That the ship is on an even keel is shown by the location of the bilge keel which is a normal distance above the bottom of the lagoon. At about frame 155 there is a vertical crack extending to the turn of the bilge and opened up perhaps a foot. Aft of this point the shell loses its pushed-to-port look but retains the horizontal wrinkles. The propellers and rudder are still attached and appear intact.

There is much wreckage strewn about the bottom of the lagoon even forward of the bow. Most of the ships components are twisted and mangled beyond recognition but certain discrete units such as the hawse pipes (which are still around the chain, but about fifty feet forward of the stem), bitts, blast gauge tower and 40MM gun are recognizable and reasonably intact. See photos on pages 21 thru 26. A set of bitts formerly located at frame 5 were recovered and were quite radioactive two weeks after "A" Day. That the disrupting effect of the blast reached inside the vessel even at the extreme forward part is shown by a report that the chain pipes could be seen more or less leaning against the stem (with the chain still through them) and resting on a pile of chain which would indicate that the chain locker was opened up.

Underwater photographs selected from a total of 60 are included in the picture section of this report. Positive identification of objects shown in the photographs and the orientation on the ship are in most cases very difficult. A sketch of the general damage as reconstructed from diver's reports is shown in sketch on page 38.

(c) Other damage.

Machinery and Electrical Damage Unobserved.

II. Forces Evidenced and Effects Noted.

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USS GILLIAM (APA57)

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(a) Heat.

None of painted frame markings were discernible to the divers.

(b) Fires and Explosions.

Unobserved.

(c) Shock.

The great damage to the weather deck, superstructure and shell plating is attributed to the blast wave.

(d) Pressure.

Air pressures of approximately 2000#/in<sup>2</sup> existed beneath the burst.

III. Results of Test on Target.

(a) Effect on Propulsion and Ship Control.

Unobservable.

(b) Effect on Gunnery and Fire Control.

Completely destroyed fire control and most of the guns on the GILLIAM. Fighting power of the GILLIAM would have been very poor had she remained afloat.

(c) Effect on Watertight Integrity and Stability.

Completely destroyed the watertight integrity and stability of the GILLIAM.

(d) Effect on Personnel and Habitability.

Unobserved prior to sinking.

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USS GILLIAM (APA57)

(e) Total Effect on Fighting Efficiency.

Completely destroyed the fighting efficiency of the ship.

IV. General Summary of Observer's Impressions and Conclusions.

(a) Photographs of the burst taken from towers and planes, afterburst photographs of the array from PBM Charlie, the reports of the technical observer in PBM Charlie, the underwater photographs, the Bureau of Ships Interim Report, and the divers report are the total available sources of information. A study of this material has been made and, although certain details were unobtained, the results are compiled here in an attempt to give the story of the ship from the time of bomb burst to the time of sinking.

Unlike the other ships sunk in "A" Test, the GILLIAM was never clearly seen floating after the air burst. The light intensity of burst obscured the GILLIAM in the only slow motion pictures taken (Navy film #18377) during the first few seconds of "A" Test. Thereafter the clouds obscured the GILLIAM.

Triangulation of the burst calculated from aerial and tower views indicate that the GILLIAM was the ship closest to the actual burst. The extensive damage suffered by the GILLIAM would seem to confirm this calculation. Apparently the air blast came from a direction forward, to starboard and almost overhead of the ship's bow.

The divers found the GILLIAM lying in about 180 feet of water. In six days diving, it was possible to examine the ship thoroughly along the starboard side, the port bow and the forward deck. Extensive wreckage prevented detailed examination of the remainder of the vessel within reasonable time limits and with adequate safety. Approximately 60 underwater photographs were taken by the divers. Orientation and identification of these photographs was not completed by the divers probably because of the extensive wreckage and the fact that painted frame numbers were not visible. Most of these pictures, which are in the Bureau of Ships files, were not included in the report because of poor definition.

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USS GILLIAM (APA57)

V. Preliminary Recommendation.

None.

VI. Pre-test Statistics.

(a) Instructions for loading the vessel specified the following.

ITEM	LOADING
Fuel Oil	50%
Diesel Oil	50%
Ammunition	50%
Potable and Reserve Feed Water	95%
Salt Water Ballast	95%

The Army Engineers secured a bull dozer, searchlight and generator, fire fighting equipment, radiation and water distilling equipment on the upper deck of the GILLIAM for test purposes. The Bureau of Aeronautics secured a VF airplane on upper deck aft.

Details of the actual quantities of the various items aboard are included in Report 7, Stability Inspection Report, submitted by the ship's force in accordance with "Instructions to Target Vessels for Tests and Observations by Ship's Force" issued by the Director of Ships Material. This report is available for inspection in the Bureau of Ships Crossroads Files.

The GILLIAM at time of burst floated at drafts of 9'9" forward and 17' 9" aft. She had a list of one degree to port.

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USS GILLIAM (APA57)

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

- (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

- (b) Structural damage.

#### HULL

The vessel sustained no damage to the main hull. Superstructure on the starboard side has light superficial damage.

#### MACHINERY

The outer casings of both stacks were moderately dented on both sides, aft.

#### ELECTRICAL

Not observed.

- (c) Other damage.

#### HULL

Not observed.

#### MACHINERY

An electric drinking fountain in a passageway opening into the after cargo space was smashed by blast pressure entering via the cargo hatch opening.

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USS BANNER (APA60)

## ELECTRICAL

12" searchlights were damaged by blast. A number of lamps were broken by shock. A small amount of cable was scorched by blast heat. The P.A.B. amplifier on the signal bridge was destroyed by fire.

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

#### HULL

Heat radiation came from approximately 150 degrees relative. Heat charred and blistered paint on the entire starboard side and caused a fire on the signal bridge. Signal halyards were burned. Exposed cordage was scorched.

#### MACHINERY

Not evidenced in machinery spaces.

#### ELECTRICAL

Exposed paint work was scorched by the blast heat. A small amount of electrical cable had the surface scorched by the heat.

### (b) Fires and explosions.

#### HULL

A fire was started by heat radiation in the starboard flagbag and damaged adjacent equipment.

There were no explosions.

#### MACHINERY

Not evidenced.

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USS BANNER (APA60)

## ELECTRICAL

A fire occurred in the starboard flag bag on the signal bridge. There were no explosions.

(c) Shock.

## HULL

Shock came from approximately 150 degrees relative. About seventy light bulbs in topside structure, starboard were broken. Bulbs in shock mounts were undisturbed.

## MACHINERY

Not evidenced.

## ELECTRICAL

A number of lamps were broken by shock. Most of these were located above the main deck.

(d) Pressure.

## HULL

The apparent direction of the pressure blast was from approximately 165 degrees relative.

## MACHINERY

Blast pressure moderately dented the outer casings of both stacks, and smashed an electric drinking fountain exposed to the direct effect of the pressure.

## ELECTRICAL

There were no effects of pressure noted in electrical equipment.

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USS BANNER (APA60)



(e) Effects peculiar to the atomic bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

The scorching by what was apparently radiant heat is the only effect noted as being peculiar to the atom bomb.

III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

HULL

None.

MACHINERY

The damage had no effect on the operation of the machinery installation. Ship control was not affected insofar as machinery was concerned.

ELECTRICAL

There was no effect on propulsion and ship control.

(b) Effect on gunnery and fire control.

HULL

None.

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USS BANNER (APA60)

MACHINERY

No comment.

ELECTRICAL

There was no effect on gunnery and fire control.

(c) Effect on watertight integrity and stability.

HULL

The watertight integrity and stability of the vessel were not affected by the test.

MACHINERY

No comment.

ELECTRICAL

There was no effect on watertight integrity and stability.

(d) Effect on personnel and habitability.

HULL

Some injury to personnel would have probably resulted from the blast pressure or from the cargo hatch covers being blown into the holds. Habitability was negligibly affected.

MACHINERY

The test would have had no effect on personnel or habitability insofar as machinery is concerned.

ELECTRICAL

Electrical damage would have had no effect on the personnel nor on the habitability of the vessel.

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USS BANNER (APA60)

(e) Effect on fighting efficiency.

HULL

The blast pressure did not impair either the hull strength or its seaworthiness. The superficial damage done to the superstructure did not affect the operability of equipment.

MACHINERY

None, insofar as machinery is concerned.

ELECTRICAL

Electrical damage would have had no effect on the fighting efficiency of the vessel.

IV. Summary of Observers' Impressions and Conclusions.

HULL

Damage is superficial. While some casualties might have been sustained by personnel stationed topside, the vessel would have been able to proceed on its mission.

MACHINERY

The BANNER was outside the effective range of the explosion in test A.

ELECTRICAL

The vessel suffered moderate blast in the weather areas and moderate shock to the superstructure areas. There was sufficient heat to ignite inflammable material.

V. Preliminary Recommendations.

HULL

No comment.

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USS BANNER (APA60)

## MACHINERY

None.

## ELECTRICAL

Light weight salient equipment should have its exposed area reduced as much as possible, or should be strengthened. Combustible material should not be exposed topside. High shock lamps should be used throughout the vessel.

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USS BANNER (APA60)

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## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

#### HULL

The vessel suffered moderate blast damage to topside structure such as stacks and port side exposed bulkheads and doors.

Cargo hatch pontoons and boards were dislodged.

#### MACHINERY

No comment.

#### ELECTRICAL

Only structural damage which affected electrical equipment was the failure of the #1 cargo hold hatch covers. The falling hatch covers damaged special Bureau of Ships electrical test material in this hold.

##### (c) Other damage.

#### HULL

No comment.

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USS BARROW (APA61)

## MACHINERY

A few sections of small piping were broken. There was no other damage to machinery during Test A.

## ELECTRICAL

This vessel received only very slight electrical damage. Major items of damage were as follows:

1. Three cargo lights were damaged by air blast.
2. Two pelorus repeaters were knocked from their stands.
3. A brush on the port 24 inch searchlight was dislodged.
4. Approximately forty lamps were broken throughout the ship.
5. Insulation burned off two cables due to a fire on the deck above.
6. The standard compass binnacle was carried away.
7. One telephone hand-set was damaged.
8. The anemometer cups were carried away.

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

## HULL

A flash heat emanated from an approximate bearing of 345 degrees relative and blistered paint on surfaces facing to port and forward. In addition, a fire was started in some manila line on the after deck house.

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USS BARROW (APA61)

## MACHINERY

Paint on the exposed side of deck machinery was scorched and blistered.

## ELECTRICAL

Radiant heat on the port bow scorched the paint on top-side electrical equipment and cable. Since only the first layer of paint was burned, no electrical equipment was rendered inoperable..

(b) Fires and explosions.

## HULL

A secondary fire occurred on the after deck house in exposed manila line. This fire apparently was caused by ignition of the manila line and possibly by ignition of some gasoline from a handy-billy pump. There is some evidence of a small explosion in the same area.

## MACHINERY

No evidence.

## ELECTRICAL

A small fire on top of the after deck house, port side, destroyed the insulation on one lighting and one fire control cable installed on the overhead of the compartment below.

(c) Shock.

## HULL

A shock, of light intensity, caused breakage of a few rusted threaded joints in piping in various parts of the vessel.

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USS BARROW (APA61)

## MACHINERY

No evidence.

## ELECTRICAL

There was evidence that the vessel may have received shock since approximately 40 lamps were broken and a searchlight ship ring brush was dislocated.

(d) Pressure

## HULL

A blast wave struck the vessel from an approximate bearing of 345 degrees relative. The blast caused moderate damage to exposed structure facing to port and forward and dislodged cargo hatch battens and pontoons.

## MACHINERY

Whipping motion of the vessel following the blast apparently broke a few sections of small piping. Blast pressure slightly dented the outer casings of both stacks.

## ELECTRICAL

Air blast is considered to be responsible for most of the damage to electrical equipment on this vessel. The damage to cargo lights, telephone hand-set, pelorus repeaters, standard compass, and the wind intensity system is considered to be due to the air blast.

(e) Effects peculiar to the atom bomb.

## HULL

Flash heat and pressure exerted over large areas is evident. No radiological hazards were found when the vessel was boarded on the day after the burst.

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USS BARROW (APA61)



## MACHINERY

None.

## ELECTRICAL

The radiological effects and intense radiant heat are considered peculiar to the atom bomb. This vessel appeared to have received a sharper impact or shock than practically identical ships located ahead and astern of this vessel in the target array.

### III. Results of Test on Target.

#### (a) Effect on machinery, electrical, and ship control.

## HULL

No damage occurred to machinery or ship control. Electrical equipment, other than radio antennae, is undamaged.

## MACHINERY

None. The slight damage to piping does not affect the overall operation of the machinery plant. This damage is all minor, does not affect any vital unit, and can be easily and quickly repaired by the ship's force.

## ELECTRICAL

The effects on electrical equipment and ship's control were very slight. Except for the damage to two cargo lights, anemometer cups, standard compass binnacle, and one telephone, all electrical damage could have easily been repaired by the ship's force.

#### (b) Effect on gunnery and fire control.

## HULL

No damage occurred to equipment. Personnel casualties from the blast wave might have occurred in exposed topside stations.

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USS BARROW (APA61)

## MACHINERY

No comment.

## ELECTRICAL

Except for the burning of one cable to a director, there was no effect electrically on gunnery or fire control. It is considered that if a crew had been aboard, the fire could have easily been controlled and the damage prevented.

(c) Effect on watertight integrity and stability.

## HULL

None.

## MACHINERY

No comment.

## ELECTRICAL

None.

(d) Effect on personnel and habitability.

## HULL

It is doubtful whether the blast or heat would have caused personnel casualties, except in exposed stations. Habitability is very slightly affected in that living spaces, adjacent to the cargo hatches, have to be made weather tight in case of inclement weather.

## MACHINERY

None below decks.

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USS BARROW (APA61)

## ELECTRICAL

It is estimated that there would have been casualties to exposed personnel due to the air blast and the radiant heat. Personnel in protected areas would not have been affected. The effects of radioactivity on personnel are not known. Habitability was not affected by this test.

(e) Effect on fighting efficiency.

## HULL

The damage to radio antennae with the resulting effect on external communications and the possible personnel injuries from blast in exposed stations would have only a slight effect on the fighting efficiency of the vessel.

## MACHINERY

None.

## ELECTRICAL

The effect on the fighting efficiency of this vessel from an electrical standpoint was negligible. It is considered that the only reduction in fighting efficiency would have been from personnel casualties.

## IV. Summary of Observers' Impressions and Conclusions.

## HULL

Disregarding the effects of radioactivity, it appears that this vessel would be able to carry out its assigned mission. All damage repairs are either within the capacity of the ship's force or could be delayed until some future Navy Yard overhaul.

SECRET

USS BARROW (APA61)

## MACHINERY

The BARROW was outside the effective range of the explosion during Test A.

## ELECTRICAL

This vessel was too far from the center of the blast to receive significant material damage as a result of this test. It appears that at this distance the major consideration for the change in the design of naval vessels will be the protection of personnel.

## V. Preliminary Recommendations.

### HULL

Cargo hatch pontoons and boards should have more positive securing arrangements.

### MACHINERY

None.

### ELECTRICAL

It is recommended that the gimbal pins which hold pelorus repeaters be lengthened and threaded binnacle pins with locking nuts to be used. It is believed that a great deal of the damage to pelorus repeaters experienced by vessels in this test would be eliminated by such a change.

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USS BARROW (APA61)

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, list, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

#### HULL

Damage is negligible. It consists of the blowing out of five screens on stack ventilators, the blowing off of two covers on small lockers, and the lifting of about one-third of the hatch boards of both upper deck cargo hatches.

#### MACHINERY

No comment.

#### ELECTRICAL

None.

##### (c) Other damage.

#### HULL

No comment.

#### MACHINERY

The machinery was not damaged by Test A.

SECRET

USS BLADEN (APA63)

## ELECTRICAL

The main electric plant, ship propulsion and electrical elements of ship control, fire control and gunnery were undamaged and operated satisfactorily.

### II. Forces Evidenced and Effects Noted.

#### (a) Heat.

##### HULL

Heat radiation came from the port quarter. This radiation slightly damaged surfaces normal to the radiation source. Manila lines are slightly scorched.

##### MACHINERY

Not evidenced.

## ELECTRICAL

This vessel was subjected to radiant heat approaching from the port quarter, but not of sufficient intensity to cause damage to any electrical equipment. The heat wave was evidenced by some blistering of paint in exposed areas and starting of small fires in brooms, swabs and Army Quartermaster gear.

#### (b) Fires and explosions.

##### HULL

One large rope fender of cocoa matting exterior that hung over the port side burned. Signal halyards and several swabs located on top of the Loran shack burned. Bundles of U.S. Army shoes, matting, and clothes stowed on the after deck house also caught on fire. The fires did not damage the vessel. There were no explosions.

SECRET

USS BLADEN (APA63)

## MACHINERY

Not evidenced.

## ELECTRICAL

1. Small fires were started in brooms and swabs on the portside of O1 level and Army Quartermaster gear displayed for test on after deckhouse.

2. There were no explosions.

3. There was no damage to any electrical equipment as a result of fires.

(c) Shock.

## HULL

No evidence of shock was observed.

## MACHINERY

Not evidenced.

## ELECTRICAL

The only evidence of shock noted was a broken filament in a 50 watt rough service lamp, located in pilot house. There was no other damage to electrical equipment as a result of shock.

(d) Pressure.

## HULL

There is no evidence of pressure damage other than the slight damage to vent screens and broken glass windows in two sprinkler control boxes.

SECRET

USS BLADEN (APA63)

## MACHINERY

Not evidenced.

## ELECTRICAL

The only evidence of pressure was the blowing inward of the expanded metal screens in stack louvers. There was no damage to any electrical equipment.

(e) Effects peculiar to the atom bomb.

## HULL

No effects other than heat radiation and radioactivity were noted.

## MACHINERY

None.

## ELECTRICAL

Other than Radioactivity, radiant heat and blast pressure were the effects noted apparently peculiar to the atom bomb.

### III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

## HULL

None.

## MACHINERY

Test A had no effect on machinery or ship control.

SECRET

USS BLADEN (APA63)



ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Except for radiological factors, probably only a few personnel exposed on topside would have been injured. Habitability, except for radiological factors is unimpaired.

SECRET

USS BLADEN (APA63)

## MACHINERY

None.

## ELECTRICAL

1. Other than the effects of radioactivity, personnel at exposed topside stations would probably have suffered minor to moderate flash burns from radiant heat and possibly injuries from blast pressure waves to the extent of a few bruises.

2. Habitability has in no way been affected.

(e) Effect on fighting efficiency.

## HULL

Except for radiological factors and possibly some injury to exposed topside personnel, the fighting efficiency is unimpaired.

## MACHINERY

None.

## ELECTRICAL

The fighting efficiency of this vessel has in no way been affected as a result of any material damage.

## IV. Summary of Observers' Impressions and Conclusions.

## HULL

Damage is superficial, while injury might have been suffered by some personnel exposed topside, the vessel would have been able to fulfill its mission.

## MACHINERY

The BLADEN was beyond the effective range of the explosion of Test A.

SECRET

USS BLADEN (APA63)

ELECTRICAL

The location of this vessel in the target array was outside the effective range of the bomb to cause any material damage.

V. Preliminary Recommendations.

HULL

No comment.

MACHINERY

None.

ELECTRICAL

None.

SECRET

USS BLADEN (APA63)

# TECHNICAL INSPECTION REPORT

## OVERALL SUMMARY

### I. Target Condition After Test.

#### (a) Drafts after test, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

#### (b) Structural damage.

##### HULL

None.

##### MACHINERY

No comment.

##### ELECTRICAL

1. Structural damage consists of a few light metal surfaces (5# or less) and lower part of #2 stack being dished in direction of blast; also expanded metal vent screens blown from both stacks.

2. There was no electrical damage incurred as a result of the above structural damage.

#### (c) Other damage.

##### HULL

Not observed.

SECRET

USS BRACKEN (APA64)

## MACHINERY

None.

## ELECTRICAL

1. Close visual inspection and operating test revealed only superficial damage to electrical equipment.

2. There was no damage observed to any electrical units associated with fire control, ship control and gunnery.

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

## HULL

Radiation emanated from relative bearing of about 205 degrees and an elevation of about 5 degrees. It caused scorching and blistering of painted surfaces normal to the blast. Scorching of exposed cordage is also noted.

## MACHINERY

There was no evidence of heat on machinery or in machinery spaces, except for scorched paint in exposed areas.

## ELECTRICAL

Paint surfaces of topside electrical equipment and exposed wiring approximately normal to direction of bomb burst (about 215° relative) are usually scorched and blackened. There are no localized heavy burns or damage other than to paint resulting from this flash of radiant heat.

### (b) Fires and explosions.

SECRET

USS BRACKEN (APA64)

## HULL

Three signal halyards and unpainted canvas covered pads on the gripe of the forward port LCVP davit are the only items on the vessel that burned. These were ignited, it is believed, by direct heat radiation.

## MACHINERY

Not evidenced.

## ELECTRICAL

1. Several small fires were ignited in exposed top-side combustible material, all of which are believed to have contained oil. Particularly susceptible were mops, mats, boat gripes, boat fenders and other fibrous materials.

2. There were no fires started in any electrical equipment or any damage resulting from the above fires.

3. There is no evidence of any explosions having occurred onboard this vessel.

(c) Shock.

## HULL

None.

## MACHINERY

Not evidenced.

## ELECTRICAL

Approximately six lamps all inside of ship were broken apparently from shock transmitted through hull. The cover for a portable Xray machine mounted on bulkhead, facing blast was dislodged. However this could be due to slight deflection of bulkhead on which mounted.

SECRET

USS BRACKEN (APA64)

(d) Pressure.

HULL

There is slight dishing of light plating 5# or less in the superstructure which was exposed to the blast. The blast came from a point bearing 205 degrees relative.

MACHINERY

Not evidenced.

ELECTRICAL

The port 12" signal light located on signal bridge was thrown off support. There was no locking device installed to prevent vertical movement of this light. The cover for blinker light signal key located on port side of navigation bridge was blown off. Close examination revealed holding down bolts were rusted through.

(e) Effects peculiar to the atom bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

Radioactivity and radiant heat were the only effect observed that are apparently peculiar to the atom bomb. Neither of these caused any material damage to electrical equipment.

SECRET

USS BRACKEN (APA64)

III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

HULL

Not observed.

MACHINERY

None.

ELECTRICAL

No appreciable effect.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

SECRET

USS BRACKEN (APA64)



ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Exposed personnel may have suffered from flash burns and radiation sickness. Habitability is not affected.

MACHINERY

None.

ELECTRICAL

1. Personnel manning exposed topside stations would probably have suffered minor to moderate flash burns and possibly injuries from blast pressure wave to extent of a few bruises.

2. Habitability has in no way been affected.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

SECRET

USS BRACKEN (APA64)

#### IV. General Summary of Observers' Impressions and Conclusions.

##### HULL

No comment.

##### MACHINERY

The BRACKEN was outside the effective range of the explosion in Test A.

##### ELECTRICAL

Due to the distance of this ship from center of burst, heat and blast of bomb was not sufficient to cause any appreciable damage to electrical equipment.

#### V. Preliminary Recommendations.

##### HULL

None.

##### MACHINERY

None.

##### ELECTRICAL

None.

SECRET

USS BRACKEN (APA64)

# TECHNICAL INSPECTION REPORT

## OVERALL SUMMARY

### I. Target Condition After Test.

#### (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts  
or list.

#### (b) Structural damage.

##### HULL

Damage is superficial and consists of the dishing  
of flag bags, stacks, some topside bulkheads exposed to the blast,  
and the dislodgment of cargo hatch battens.

##### MACHINERY

No comment.

##### ELECTRICAL

None observed.

#### (c) Other damage.

##### HULL

Not observed.

##### MACHINERY

None.

##### ELECTRICAL

There was no electrical damage.

SECRET

USS BRISCOE (APA65)

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

#### HULL

Heat radiation appears to have come from about 140 degrees relative at an elevation of 5 to 10 degrees. Very little blistering or scorching occurred forward of frame 80. The forward stack is blistered slightly to starboard. Vertical surfaces exposed and normal to the blast have slight blistering.

All manila running rigging on the port side abaft amidships is scorched as were two searchlight covers over the signal bridge. Stockholm tar on the mainmast standing rigging was reduced to carbon on the face exposed to the radiation, except deep in the lay of the wire.

#### MACHINERY

There was no damage from heat in machinery spaces or to machinery. The only evidence of it was scorched paint topside.

#### ELECTRICAL

The only evidence of heat was the scorching of painted surfaces directly exposed to the blast.

### (b) Fires and explosions.

#### HULL

One fire burned No. 2 hatch tarpaulin and carbonized paint on the upper deck hatch coaming and strongbacks. It is believed the direct heat radiation ignited the tarpaulin, since the hatch boards had fallen below, fire was able to reach the painting on the coaming and strongbacks.

There were no explosions.

SECRET

USS BRISCOE (APA65)

MACHINERY

No evidence.

ELECTRICAL

There was no electrical damage from fires or explosions.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no electrical damage from shock.

(d) Pressure.

HULL

The blast center was slightly to starboard of astern as is evidenced by the dishing of top side plating facing aft. 7 1/2 pound plating showed slight dishing where the span was four feet or more. Lighter plating is dished and distorted. The critical plating weight appears to about 10 pound mild steel since only lighter plating suffered damage.

MACHINERY

The outer casing of the after stack was slightly dented by blast pressure.

SECRET

USS BRISCOE (APA65)

ELECTRICAL

There was no electrical damage as a result of pressure.

(e) Effects peculiar to the atomic bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

The intense radiant heat was the only peculiar effect noted.

III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

HULL

Not observed.

MACHINERY

No damage.

ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

Not observed.

SECRET

USS BRISCOE (APA85)

MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Topside personnel, exposed to the blast, would very likely have suffered from flash burns and possibly radiation injury of some degree. Habitability is not affected.

MACHINERY

None.

ELECTRICAL

None.

SECRET

USS BRISCOE (APA65)

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

Fighting efficiency was not impaired by any electrical damage.

IV. General Summary of Inspector's Impressions and Conclusions.

HULL

No comment.

MACHINERY

The BRISCOE was outside the effective range of the explosion during test A.

ELECTRICAL

The vessel was too far from the blast to receive anything other than very minor damage.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

SECRET

USS BRISCOE (APA65)



ELECTRICAL

None.

SECRET

USS BRISCOE (APA65)

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## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, consequently no change in drafts or list.

##### (b) Structural damage.

#### HULL

At the time of the test this vessel had all watertight closures open except those to magazines and ammunition hoists. All covers were off the cargo hatches. This was done in order to test the validity of a theory that less damage might result if interior spaces were left completely open in order to permit rapid equalization of exterior and interior pressures.

The vertical plating on the starboard side of the superstructure and in the starboard well deck is generally dished, with diminishing intensity from forward to aft.

Metal joiner bulkheads and sheet metal light locks on the main deck and above are blown out or distorted. Damage of this nature occurs principally in way of weather doors and cargo hatches and is carried for considerable distances into interior spaces. In the same areas there is no marked failure of structural bulkheads. Most metal furniture and lockers in areas near weather openings are damaged. Because access closures were opened, this damage is greater than it otherwise would have been.

Deck dishing is confined essentially to the upper deck and occurs in the area to starboard of the forward cargo hatch and aft of the after deck house.

SECRET

USS BRULE (APA66)

The only shell dishing attributable to test A is slight and occurs on the starboard bow and quarter.

There is no structural damage below the waterline.

#### MACHINERY

The outer casings of both stacks were moderately dented. The steering wheel in secondary conn, superstructure deck, was bent (the shaft can be turned).

#### ELECTRICAL

Structural damage affecting electrical equipment was essentially as follows:

1. Dishing and whipping of starboard outboard bulkhead on main deck cracked insulating panels of boat davit controllers.

2. Rupturing of light metal bulkheads on main deck carried away a few cables, lighting fixtures and the dishwasher motor controller.

(c) Other damage.

#### HULL

No comment.

#### MACHINERY

The two starboard Welin davits sustained electrical damage. An oil ring jumped out of its groove on #1 ship's service generator. The car of the gasoline hoist jammed in its trunk, the trunk and carriage being sprung and distorted. The machine shop drill press column (cast iron) broke. There is minor damage to piping.

SECRET

USS BRULE (APA66)

## ELECTRICAL

One generator set was made inoperable due to an oil ring jumping or rolling out of place.

The two starboard boat davit controllers and a dishwasher controller were inoperable due to broken insulating panels.

A few storage batteries were jarred off racks.

Gyro repeaters on wings of bridge were blown from their supports.

The starboard 24" searchlight king pin was bent.

Two of the four operating table lights were damaged by blast.

The standard compass binnacle was torn loose.

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

## HULL

The source of radiation bore about 120 degrees relative. All surfaces facing aft or to starboard, unless shielded by structure, are blistered. Evidence of vortexing of the heat wave was seen on the starboard boat davits where blistering and scorching of paint occurred on the lee sides. Zinc chromate, formula 84, seems to be affected more than ordinary top coats similarly exposed. Wood surfaces received greater blistering than corresponding steel surfaces. Grease was not burned on cables or hoist drums. No glass was broken by heat. Scorching of all exposed fire hoses and cordage was noted. Insulation was scorched on a few electric cables on the starboard side aft.

## MACHINERY

Paint on the starboard side of exposed machinery is scorched and blistered.

SECRET

USS BRULE (APA66)

## ELECTRICAL

Heat was evidenced by scorched paint on apparatus exposed to the blast and by cable insulation which exuded thru armor on a few exposed cables.

(b) Fires and explosions.

## HULL

No explosions and no fires of any importance occurred on the BRULE. Swabs in two topside racks burned. Ignition is believed to have been caused by direct radiation penetrating the cotton fibres of the swabs.

## MACHINERY

No evidence.

## ELECTRICAL

No fires or explosions affecting electrical equipment were noted.

(c) Shock.

## HULL

Shock damage is slight. A drill press pedestal in the machine ship is broken near the deck. Shock caused an oil ring to jump out of a bearing in number one ship's service generator. Gyro repeaters on both wings of the navigating bridge were knocked off their pedestals. A gyro repeater on the signal bridge level was adrift from its trunnions. Shock, or blast pressure, caused breakage of small salt water pipes in heads and showers. This piping was already badly corroded.

## MACHINERY

No evidence.

SECRET

USS BRULE (APA66)

## ELECTRICAL

Shock may have caused the oil ring of No. 1 Sh'p's Service generator to jump out of its normal location. There was no other evidence of shock on electrical equipment.

(d) Pressure.

## HULL

The pressure wave originated at a point bearing approximately 120 degrees relative. The pressure damage is of particular interest in that all weather openings were open except those to magazines and hoists. In way of the weather openings, joiner bulkheads and sheet metal lighlocks are demolished. This effect diminished with distance from the opening. Long flat panels of exterior plating on the starboard side of the superstructure and in the starboard main deck passageway are dished slightly. In general, it appears that the critical plating weight is slightly above 7 1/2 # MS. The semi-structural 5# plate longitudinal bulkhead on the main deck along the port edge of both cargo hatches was moderately dished by air blast, but this damage probably would not have occurred if hatch closures had been in place.

Both stacks are severely dished on the starboard after segment. The welded connection of the after stack to the top of the deck house is torn for a peripheral distance of 8 feet.

Forward and after starboard cargo booms, stowed horizontally in end cradles, are bent due to blast pressure and inertia effect.

## MACHINERY

Blast pressure and the whipping motion of the ship following the blast caused all damage to the machinery installation. The blast came from starboard.

SECRET

USS BRULE (APA66)

## ELECTRICAL

Pressure or blast caused damage to topside exposed equipment such as searchlights, peloruses, binnacles and to lighting fixtures below decks near openings.

- (e) Any effects peculiar to the Atom Bomb.

## HULL

Other than the effects of radioactivity, the only effect peculiar to the atom bomb is that of intense heat.

## MACHINERY

A blast pressure of this magnitude is apparently peculiar to the atom bomb.

## ELECTRICAL

Effect peculiar to the atom bomb was a combination of heat and blast effect on exposed surfaces.

### III. Effects of Damage.

- (a) Effect on machinery and ship control.

## HULL

Damage to boat davit controls resulted in the star-board Welin davits being put out of commission.

## MACHINERY

The following machinery is inoperable: Both star-board Welin davits (because of electrical damage); gasoline hoist; drill press; #1 ship's service generator. Damage to piping is minor and of local significance only. Overall operation of the plant and ship control were not affected. Ample electric power is available from undamaged generators. This vessel shifted berths under her own power after Test A.

SECRET

USS BRULE (APA66)

## ELECTRICAL

Propulsion and propulsion control were not affected by test A damage to electrical equipment.

The effect of A bomb damage on ship control was negligible.

(b) Effect on gunnery and fire control.

## HULL

No effect on gunnery or fire control resulted. The SC4 radar is inoperative because of electronics damage. The range-finder is undamaged.

## MACHINERY

No comment.

## ELECTRICAL

The effect of A bomb electrical damage on gunnery and fire control was negligible.

(c) Effect on watertight integrity and stability.

## HULL

Watertight integrity was impaired only by the possibility that heavy seas could wash into the ship through distorted hatch coamings and covers on the upper deck aft and through damaged access closures in the starboard main deck weather passageway.

Damage to hatches and doors would have been materially less had these closures been dogged shut during the test.

Stability is not affected.

SECRET

USS BRULE (APA66)



## MACHINERY

No comment.

## ELECTRICAL

Electrical damage had no effect on watertight integrity and stability.

(d) Personnel and habitability.

## HULL

It is considered that all personnel on exposed decks and near weather access openings would have been injured by air blast, heat, or radioactivity. It is not believed that there would have been any effect on personnel below decks except those exposed to boiler flare-backs.

Habitability was reduced temporarily by damage to furniture and lockers, blocking of passages by demolished joiner-bulkheads, light locks, and ladder pans, and breakage of pipes in heads and showers.

## MACHINERY

This vessel was left open during the test. Under these conditions, there would probably have been a considerable number of personnel casualties below deck. However, if she had been closed up (condition A), there would have been no personnel casualties below decks. Damage to piping in heads and showers had a temporary minor effect on habitability which could be remedied by the ship's force in a short time.

## ELECTRICAL

Electrical damage had a negligible effect on personnel and habitability. Damage affecting habitability was limited to the breaking of a few lamp bulbs and fixtures.

SECRET

USS BRULE (APA66)

(a) Effect on fighting efficiency.

HULL

Fighting efficiency would have been lost temporarily due to personnel casualties in gunnery, fire control, and ship control stations, and possible casualties in boiler rooms. A reduction in efficiency of the vessel in unloading troops would have resulted from failure of the electrical equipment controlling the starboard Welin davits. Some effect on ship propulsion would have resulted from generator damage.

MACHINERY

The only effect of the test on fighting efficiency from a machinery point of view was to reduce the vessel's ability to lower boats until the electrical damage to the starboard Welin davits was repaired.

ELECTRICAL

Fighting efficiency was considerably reduced by the damage to the starboard boat davit controllers.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

Casualties to exposed personnel would have been heavy but the ship could have proceeded on her mission at reduced efficiency because of damage to boat davit controls. Most of the interior damage suffered by BRULE was caused by the fact that all access was left open. After a period of reorganization and cleaning up, the ship could probably have continued in operations with only slight reduction in efficiency.

MACHINERY

The BRULE was apparently just outside the range of serious damage to machinery from this form of attack.

SECRET

USS BRULE (APA66)

## ELECTRICAL

The only electrical damage having an appreciable effect on the operation of the vessel was that to the two starboard boat davit controllers. Damage to these units materially affected the ship's ability to disembark troops.

Damage to the 24" searchlight, the gyro repeaters and the standard compass had little effect on the operation or fighting efficiency of the ship. Damage to the No. 1 Ship's Service generator did not appreciably affect the operation of the vessel or fighting efficiency since ample power was available from a spare unit.

### V. Preliminary Recommendations.

## HULL

Gunnery and fire control personnel should be housed as far as practicable in protective enclosures of cylindrical or spherical shape to reduce loss of personnel or equipment due to effect of blast and heat.

Attention should be given to more effective means of cradling cargo booms to prevent bending due to inertia effects.

Joiner and sheet metal bulkheads should be kept to a minimum and should not be installed near weather access openings. Plating under 10 pounds in weight should not be used in areas exposed to air blast of this magnitude.

Electrical equipment boxes should be better protected against air blast and the equipment should be made more shock resistant.

## MACHINERY

It is recommended that the design of oil rings on the ship's service generators of this vessel be studied to determine means of preventing casualties such as the one that occurred on this vessel.

SECRET

USS BRULE (APA66)

## ELECTRICAL

Oiling arrangements for rotating machinery should preferably be of the pressure type or should be so arranged that shock or rolling of the vessel to any angle at which the ship will stay afloat will not derange the lubrication system.

Motor controllers should be of navy standard type wherever practicably. Methods of supports should be such that a considerable movement or distortion of the supporting bulkhead or deck can take place without derangement of the controller mechanism. Where navy type controllers are not practicably, the controller should comply as nearly as practicably with Navy Department specifications for shock proofness. Supports for vital non-navy type controllers should be designed to protect the mechanism against shock.

Storage battery stowage racks should be designed to securely hold the plates and jars onto the racks. The securing means should be such as to minimize the probability of careless nonuse.

Gyro repeater mounting arrangements should be redesigned to eliminate gimbel rings where not essential and to provide a more rugged securing arrangement.

Searchlights (24" and 36") should be redesigned to have less resistance to air blast. If trunion arms and king pins are used they should be of a stronger design. High intensity signaling lights larger than 12" in diameter should be provided with remote shutter control and remote positioning so that the signalman can be in a protected location.

Operating room lights should be redesigned to provide a more rugged method of securing the lamp mechanism.

Magnetic compass binnacles should be redesigned to be less susceptible to blast damage and to have more rugged gimble rings.

Bull horns or similar intermittently used special equipment which must be installed in exposed locations. That which it is not practical to steam line, should be arranged for convenient storage in a protected location when not in use.

SECRET

USS BRULE (APA66)

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

- (a) Drafts after test; list; general areas of flooding, sources.

There is no flooding, hence no change in draft or list.

- (b) Structural damage.

#### HULL

Structural damage is superficial. Both stacks were slightly dished. Bulkhead 122 in the port main deck weather passage-way and two doors in this bulkhead are dished. Exposed superstructure bulkheads having long spans are slightly dished. The flag bags is cracked. Miscellaneous canvas covers and wind screens on topside are torn and securing pipes are bent. One signal halyard is parted. There is considerable warping of some bulkheads and decks incident to two fires which burned 8 inch hawsers.

#### MACHINERY

No comment.

#### ELECTRICAL

There was no structural damage observed which affected electrical equipment.

- (c) Other damage.

#### HULL

Not observed.

SECRET

USS BUTTE (APA68)

## MACHINERY

A number of acetylene bottles stowed around the base of the after deck house were damaged incident to a fire in mooring lines in this locality. There is no other damage to any part of the machinery installation of this vessel.

## ELECTRICAL

Approximately a dozen electric lamp bulbs were broken and the dial window of the gyro-compass repeater at the after steering station was cracked. Other electrical damage was a result of fire and consisted of the following:

1. Cables supplying lighting, general announcing, radio and radar equipment between frames 128 and 139 and frames 25 and 36 on the 01 and 02 decks, starboard side were burned and shorted.
2. Three lighting fixtures were damaged beyond repair by the fire.
3. Two general announcing reproducers were damaged beyond repair by the fires.

## II. Forces Evidenced and Effects Noted.

- (a) Heat.

## HULL

Radiation from about 290 degrees relative and an elevation of about 8 degrees caused medium damage to exposed vertical painted surfaces. Only one coat of paint was damaged. Exposed line and cordage is rather heavily scorched.

## MACHINERY

Heat blistered and scorched paint on deck machinery, and caused small fires in combustible material (cordage, balsa life rafts, etc.) topside. There is no evidence of heat in machinery spaces.

SECRET

US BUTTE (APA68)

## ELECTRICAL

Radiant heat on the port bow slightly scorched paint on exposed electrical equipment and cable. This radiant heat was not of sufficient duration to cause direct damage.

(b) Fires and explosions.

## HULL

Two medium fires were ignited by direct heat radiation upon old 8" hawsers faked down on house tops. One fire originated atop the smoke pot house around frame 130. It destroyed seventeen life rafts and caused an acetylene cylinder to explode. The interior of the adjacent space, which used as a gear locker, was gutted. The other fire on top of the radar control station, frames 27 to 36, upper deck, burned a cargo net. Some lighting cable in the station and in the adjacent 40mm ammunition stowage, A-0101-M, was destroyed.

Three minor fires burned two cocoa matting fenders on the port side and a life raft on the upper deck, frame 67.

## MACHINERY

A fire in mooring lines on top of the after deck house caused overheating and expansion of acetylene in bottles stowed around the base of the deck house. The thermostatic fuse in one of these bottles failed to function and the bottle exploded. The fuses in the other bottles functioned and the acetylene leaked out of these bottles.

## ELECTRICAL

The radiant heat indicated above started fires in exposed deck gear which damaged electrical equipment as follows:

1. Fire on the top of the starboard side of the forward deck house frames 25 to 36 damaged wiring in the compartments below. Power cable in the forward radar control room was scorched but still operable. Cable for lighting in the forward 40mm ready

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US BUTTE (APA68)

service room was grounded and short circuited. One lighting fixture was burned beyond repair.

2. Fire outboard at frame 68 on the 01 deck, port side scorched the cable to the boat davit limit switch. The circuit was not broken and the limit switch was still operable.

3. Fire on the top of the starboard side of the after deck house, frames 128 to 139, damaged wiring in the compartments below. Power cables to the after radar control room and to radio III were scorched but still operable. Cables for lighting in the radar control room, fan room, and passageway at frame 137 on the 01 deck are grounded and short circuited. Two lighting fixtures and two general announcing reproducers were damaged beyond repair.

A cylinder of acetyline gas exploded due to the heat of the fire, however, this caused no damage to electrical equipment.

(c) Shock.

#### HULL

None.

#### MACHINERY

No evidence.

#### ELECTRICAL

There was evidence that the vessel received shock since approximately a dozen electric lamps were shattered. There was no apparent direction of the shock.

(d) Pressure.

#### HULL

The blast emanated from 290 degrees relative. Critical plating weight appears to be about 7 1/2#M.S. Large spans of all exposed superstructure bulkheads are dished slightly. Doors

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and door frames on exposed surfaces are dished slightly but are still operable.

There seems to be focusing of the pressure wave in some areas due to the arrangement of surrounding structure.

Numerous upper deck hatch boards were dislodged and fell to the main deck. In addition, one main deck pontoon in each hatch fell into the hold.

#### MACHINERY

The outer casing of the after stack was very slightly dished in. (Approximately one inch).

#### ELECTRICAL

The vessel received an air blast apparently from the same direction as the radiant heat. The only effect noted on electrical equipment as a result of this air blast was the cracking of the dial window of the gyro-compass repeater at the after steering station.

(e) Effects peculiar to the atomic bomb.

#### HULL

None.

#### MACHINERY

Heat of such intensity as to cause fires at this distance from an explosion is apparently peculiar to the atom bomb.

#### ELECTRICAL

There were no effects noted that are considered peculiar to the atomic bomb other than radioactivity and the intensity of the radiant heat.

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US BUTTE (APA68)

### III. Results of Test on Target.

#### (a) Effect on machinery, electrical, and ship control.

##### HULL

Not observed.

##### MACHINERY

None. All machinery on this vessel has been operated since test A, and functions normally.

##### ELECTRICAL

The direct effects of the bomb on electrical equipment and ship control were negligible. Damage due to fire to cables, and lighting equipment could have been temporarily repaired by the ship's force by running temporary portable cables.

#### (b) Effect on gunnery and fire control.

##### HULL

Not observed.

##### MACHINERY

No comment.

##### ELECTRICAL

The damage to radar power cables seriously reduced the dependability of these cables although they still formed a complete circuit. Temporary cables could have been run by the ship's force to supply these circuits. Gunnery and fire control were otherwise unaffected by electrical damage. For damage to radar equipment see the Electronics report for this vessel.

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US BUTTE (APA68)

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Personnel probably would have received flash burns.  
The habitability of the ship would not have been affected.

MACHINERY

None below decks.

ELECTRICAL

It is considered that there would have been a few casualties to exposed topside personnel due to the radiant heat of the bomb and due to the air blast. The effects of radioactivity are unknown. There was no effect on habitability from the electrical standpoint other than the slight inconvenience due to the burned out lighting circuits.

(e) Effect on fighting efficiency.

HULL

None.

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USS BUTTE (APA68)

## MACHINERY

None, as far as machinery is concerned.

## ELECTRICAL

Other than possible personnel casualties and the damage to radar equipment due to fire, the effect on the vessel's fighting efficiency was negligible. Electrically, the only effect on fighting efficiency was the burning of radio and radar power cables. The ship's force could have run casualty power cables in these cases so that the effects would have been only temporary.

## IV. General Summary of Observers' Impressions and Conclusions.

### HULL

No comment.

### MACHINERY

The BUTTE was outside the range of damage to machinery from the explosion in test A.

### ELECTRICAL

Except for the breaking of a few lamps and the cracking of the gyro repeater dial window, all electrical damage to this vessel was of a secondary nature, being the result of fires. If personnel had been aboard the vessel, these fires could have easily been controlled and no damage to electrical equipment would have resulted.

## V. Recommendations.

### HULL

Study should be given to more adequate closure devices for cargo hatches.

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USS BUTTE (APA68)

MACHINERY

None.

ELECTRICAL

None.

SECRET

USS BUTTE (APA68)

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; list; general areas of flooding, sources.

The CARLISLE was sunk. The exact time of her sinking is not known, but it is known that she disappeared sometime between 0910 (See photo on Page 13) and 0940, the arrival time of the Technical Observer in PBM Charlie over the lagoon, when the CARLISLE was first reported by observer to be missing.

The maximum list photographed of the CARLISLE is shown in the photo on Page 13. This list is estimated to be about 10° starboard. Since divers report the starboard side of the ship apparently intact as viewed from the bottom, this list is considered to have been caused by the general displacement of topside structure to starboard by the blast. It is believed that this list materially delayed the sinking of the CARLISLE by raising the larger holes in the port shell plating above the waterline.

Sources of flooding are probably the holes in port shell plating.

##### (b) Structural Damage.

The port side of the CARLISLE which was the side exposed to the air burst was damaged extensively. Two large holes were blown in the port shell plating and there was a general displacement to starboard of topside structure.

From the bow to frame 20 port there is little evidence of damage. From frame 20 to 27, slight transverse buckles are apparent in the upper deck plating. From frame 27 to frame 60, the port side shell plating from a few feet above the turn of the bilge to the upper deck is blown into the ship. Below this hole, the shell

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USS CARLISLE (APA69)

plating is dished between frames but is without visible rupture. At frame 30 above this hole, the upper deck has been ripped loose from the shell plating and doubled back on itself until the set of bitts on the deck edge are overhead and upside down. The deck is pushed up several feet on the port side and is generally buckled to the centerline. Near the foremast, there is a tear in the upper deck which runs inboard 6 or 8 feet from the port deck edge.

A second and similar break in the port shell plating exists between frames 95 and 120. Between the two large breaks and aft to about frame 130, considerable horizontal buckling of the side is present but with no ruptures being noticed by the divers. From frame 130 aft there is no visible damage.

The starboard side of the ship is apparently intact as viewed from the bottom of the lagoon. There is a considerable amount of wreckage on the bottom along this side. Winches, gun tubs, ammunition ready service boxes, boat davits, boat propellers and rigging are among the ship's components recognized in this wreckage (see photo on Page 19). The upper deck and superstructure deck on the starboard side are apparently intact. The ladders and passageways on this side were used by the divers for access (see photo on Page 14). The deck machinery between the forward bulkhead of the bridge and foremast is missing. The foremast is standing but the topmast is broken and hanging to starboard. (See photo on Page 12). The 15 ton boom is buckled in the center. The 5 ton boom is apparently intact. The weather deck port side frame 10 to 60 is buckled and pushed up several feet at the edge. The port side of the superstructure is badly mangled, the decks in this area being impassable to divers. The stacks are sheared off and not visible. Aft on the port side, conditions are similar to those forward. Aft of frame 130 port the upper deck drops away and is impassable to divers. The mainmast and deck-house aft are uprooted and lying over the starboard side of the ship.

The forward 40MM gun tubs are intact but the starboard gun is missing. Around the stern a number of 5" projectiles and powder cases were strewn about the bottom of the lagoon.

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USS CARLISLE (APA69)

(c) Other damage.

Machinery and electrical damage was unobserved.

II. Forces Evidenced and Effects Noted.

(a) Heat.

Unobserved. Painted frame numbers are visible on the starboard side of the ship.

(b) Fires and explosions.

The CARLISLE was burning continuously from the first time she came into view until she sank. (See photo on Page 11) No explosions were noted.

(c) Shock.

The air blast is considered to have caused a general displacement of topside superstructure to starboard.

In addition to local damage, it was noted that the ship itself was blown sideways about 150 feet.

(d) Pressure.

Unobserved.

III. Results of Test on Target.

(a) Effect on propulsion and ship control.

Unobserved.

(b) Effect on gunnery and fire control.

The forward starboard 40MM guns are missing. No further information is available.

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USS CARLISLE (APA69)



- (c) Effect on watertight integrity and stability.

Complete loss of watertight integrity.

- (d) Effect on personnel and habitability.

Unknown prior to sinking.

- (e) Total effect on fighting efficiency.

Complete loss.

#### IV. General Summary of Observer's Impressions and Conclusions.

Photographs of the burst taken from towers and planes, after burst photographs of the array from PBM Charlie, the reports of the technical observer in PBM Charlie, the underwater photographs, the Bureau of Ships Interim Report, and the divers' report are the total available sources of information. A study of this material has been made and although certain details were unobtainable, the results are compiled here in an attempt to give the story of the ship from the time of bomb burst to the time of sinking.

The CARLISLE was first seen in photographs at 0902:02. At that time she was smoking heavily amidships on the port side with both stacks missing and the mainmast unidentifiable. (photo on Page 11) shows the CARLISLE at 0902:52 from the air. She continued to burn and by burst plus 5 minutes 33 seconds she had assumed a 10 degree list to starboard as shown in photo on Page 12. (The sheer of the bow seems sharper than normal. This observation agrees with the divers report of heavy shell damage from frames 27 to 60). The photo on Page 13, shows the listing CARLISLE at burst plus 9 minutes 15 seconds. Her broken mainmast can be seen lying on the deck.

There are no photographs showing the sinking of the CARLISLE. The last burst picture at approximately 0910, show the CARLISLE listing and still burning. When PBM Charlie arrived over the lagoon at 0940 she had disappeared.

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USS CARLISLE (APA69)

The CARLISLE was found in about 170 feet of water and with a small list of about 5 degrees to port. The underwater photographs (photo on Pages 14 thru 21 ) show none of the major structural damage reported by the divers. The sketch on Page 22 has been sketched from their reports.

V. Preliminary Recommendations.

None.

VI. Pre-test Statistics.

(a) Instructions for loading the vessel specified the following:

ITEM	LOADING
Fuel Oil	95%
Diesel Oil	95%
Ammunition	100% of normal allowance plus several loaded but plugged bombs, rocket heads and incendiary clusters throughout the ship. The Bureau of Aeronautics secured a VF airplane aft on the upper deck.
Potable and Reserve	
Feed Water	95%
Salt Water Ballast	None

Details of the actual quantities of the various items aboard are included in Report No. 7, Stability Inspection Report, submitted by the ship's force in accordance with "Instructions to Target Vessels for Tests and Observations by Ship's Force" issued by the Director of Ships Material. This report is available for inspection in the Bureau of Ships Crossroads Files.

The CARLISLE at time of burst floated at drafts of 9' 0" forward and 17' 0" aft. She had no list.

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USS CARLISLE (APA69)

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; general areas of flooding; sources.

There is no flooding, hence no change in drafts or list.

##### (b) Structural damage.

#### HULL

Structural damage is light and is confined principally to dishing of exposed superstructure plating of 7 1/2 pounds or less.

#### MACHINERY

No comment.

#### ELECTRICAL

There was no significant damage to the main hull and only light superficial damage on starboard side of superstructure. The horn of a general announcing reproducer located at frame 65 port side of navigating bridge was damaged by a falling flag bag. Splinters from wooden movie booth struck and slightly dented the horn of a general announcing reproducer located at frame 106 port side on 02 level. The above reproducers remained operable.

##### (c) Other damage.

#### HULL

No comment.

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U.S.S. CARTERET (APA70)

## MACHINERY

None.

## ELECTRICAL

The main electric plant, ship propulsion, and electrical elements of ship control, fire control, and gunnery remained unchanged and operable except for damage to horns or two general announcing reproducers, rotor cups on wind intensity transmitter, three lighting fixtures and starboard pelorus.

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

## HULL

Paint on vertical surfaces is scorched and blistered. Radiation came from about 140 degrees relative and at an elevation of about 10 degrees. There is no scorching of deck paint. Un-painted packing cases are scorched considerably. Fire hose used for boat gripe chafing, manila line, and marline, burlap, and cardboard are badly scorched.

## MACHINERY

No evidence.

## ELECTRICAL

This ship was subjected to a wave of radiant heat approaching from the starboard quarter with sufficient intensity to scorch and blacken paint on vertical areas normal to direction of blast and ignite fires in Army Quartermaster gear displayed on fantail and frame 145 on starboard 01 deck for test. There was no damage to any electrical equipment as a result of these fires or radiant heat.

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U.S.S. CARTERET (APA70)

(b) Fires and explosions.

HULL

There were three fires. Two were in Army Quartermaster gear displayed on the fantail. A bundle of shoes, inflammable shoe waterproofing, and cellulose bags burned completely. Another bundle of field jackets and cotton undershirts is about 75 percent burned. Judging by evidence obtained from other bundles, the fires originated in crevasses of the stowage where the air blast could not fully cool the surfaces heated by the radiation. The third fire burned the boat gribes of the starboard davits.

There were no explosions.

MACHINERY

No evidence.

ELECTRICAL

Two small fires were started in Army Quartermaster gear displayed on fantail and frame 145 on starboard side 01 deck for test. There was no damage to any electrical equipment as a result of these fires.

(c) Shock.

HULL

There is no evidence of shock damage.

MACHINERY

No evidence.

ELECTRICAL

One lamp in sick bay area and two lamps in C.P.O. quarters

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U.S.S. CARTERET (APA70)

were broken, which was apparently due to shock being transmitted through hull of vessel as these lamps were located inside enclosures where no evidence of pressure was apparent.

(d) Pressure.

HULL

The pressure wave emanated from about 135 degrees Relative. 7 1/2 pound superstructure bulkheads are slightly dished. Such dishing is most pronounced in way of doors. Exposed items fabricated from sheet metal are badly dished and distorted. Plating heavier than 7 1/2 pounds is not damaged.

MACHINERY

No evidence.

ELECTRICAL

Blast pressure approaching from starboard quarter was sufficient to blow rotor cups off anemometer transmitter located on starboard yardarm of foremast, and dislodge starboard pelorus from its gimbal support.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

Other than radioactivity, radiant heat, and blast pressure were the effects noted apparently peculiar to the atom bomb.

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U.S.S. CARTERET (APA70)

III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

HULL

No effects as a result of hull damage.

MACHINERY

None.

ELECTRICAL

The main electric plant, ship propulsion and electrical elements of ship control were unaffected and remained operable except for the following:

(a) Two lamps in the C.P.O. quarters and one lamp in sick bay area was broken.

(b) The horns on two general announcing reproducers were damaged, the units remained operable.

(c) The rotor cups were blown off anemometer transmitter, (spare rotors are carried aboard ship and can easily be replaced.).

(d) The starboard pelorus was dislodged from its gimbals. The pelorus was undamaged and need only be reset for normal operation.

(b) Effect on gunnery and fire control.

HULL

No effects as a result of hull damage.

MACHINERY

No comment.

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ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Personnel directly exposed to the bomb probably would have suffered flash burns and injuries from radiation. The habitability of the ship is not affected.

MACHINERY

None.

ELECTRICAL

Other than radioactivity, exposed personnel would have suffered minor flash burns and bruises from heat and blast pressure. The habitability of this vessel has in no way impaired as a result of this test.

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U.S.S. CARTERET (APA70)



(e) Effect on fighting efficiency.

HULL

Not affected as a result of hull damage.

MACHINERY

None.

ELECTRICAL

The minor electrical damage on this ship would have no effect on the fighting efficiency of this vessel.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

The CARTERET was outside the effective range of the explosion in Test A.

ELECTRICAL

This vessel was exposed to a flash of radiant heat followed by a blast pressure of moderate intensity. The electrical damage resulting from this test was essentially minor and could readily be repaired by the ship's force.

V. Any Preliminary, General, or Specific Recommendations of the Inspecting Group.

HULL

None.

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MACHINERY

None.

ELECTRICAL

None.

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U.S.S. CARTERET (APA70)

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources.

There is no flooding, hence no change in drafts or list.

##### (b) Structural Damage.

#### HULL

Damage is superficial, and is confined generally to exposed plating under 10# in weight. Cargo hatch covers were displaced in both hatches and fell to the deck below. No battens were distorted.

#### MACHINERY

The outer casing of the after stack was slightly dented.

#### ELECTRICAL

Not observed.

##### (c) Other Damage.

#### HULL

Not observed.

#### MACHINERY

There is no damage to machinery of this vessel, all of which has been operated since Test A.

SECRET

USS CATRON (APA71)

## ELECTRICAL

Damage to electrical equipment was negligible.

### II. Forces Evidenced and Effects Noted.

#### (a) Heat.

## HULL

Paint on exposed vertical surfaces is blistered slightly and generally scorched. Exposed cordage is somewhat scorched. Lumber on the fantail is badly charred. The heat seems to have emanated from a relative bearing of 190 degrees and an elevation of 6 degrees.

## MACHINERY

Except for scorched paint on exposed machinery, there is no evidence of heat.

## ELECTRICAL

Heat from the blast caused moderate scorching of paint on surfaces exposed, and caused one minor fabric fire.

#### (b) Fires and Explosions.

## HULL

Fire was confined to the burning of one rubberized cloth foul weather jacket on the port searchlight platform. There were no explosions.

## MACHINERY

No evidence.

SECRET

USS CATRON (APA71)

## ELECTRICAL

There was one minor fabric fire. There were no explosions.

(c) Shock.

## HULL

None.

## MACHINERY

No evidence.

## ELECTRICAL

A few broken service lamps and broken lamps in two 12" searchlights were the only indications of shock found in electrical equipment.

(d) Pressure.

## HULL

The blast wave emanated from about 190° relative. Plating under 10# in weight, directly exposed to the blast, is generally affected.

## MACHINERY

The outer casing of the after stack was slightly dented.

## ELECTRICAL

No indications of pressure were found in any electrical equipment.

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USS CATRON (APA71)

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

Slight radiant heat damage on electrical cables was the only effect peculiar to the atom bomb found in electrical gear.

III. Results of test on target.

(a) Effect on machinery, electrical, and ship control.

HULL

Not affected as a result of hull damage.

MACHINERY

The test had no effect on the machinery of the CATRON.

ELECTRICAL

Electrical damage had no effect on electric propulsion and ship control.

(b) Effect on gunnery and fire control.

HULL

Not affected as a result of hull damage.

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USS CATRON (APA71)

MACHINERY

No comment.

ELECTRICAL

Electrical damage had no effect on gunnery or on fire control.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

Electrical damage had no effect on watertight integrity nor on stability.

(d) Effect on personnel and habitability.

HULL

It is probable that many personnel directly exposed to the bomb would have suffered flash burns and radiation injury. The habitability of the ship is not affected.

MACHINERY

None.

ELECTRICAL

Electrical damage had no effect on the vessel's personnel nor would it have had any effect on habitability of the vessel.

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USS CATRON (APA71)

(e) Effect on fighting efficiency.

HULL

Not affected as a result of hull damage.

MACHINERY

None.

ELECTRICAL

Damage to electrical equipment would have no effect on the fighting efficiency of the vessel.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

The CATRON was outside the effective range of the explosion in Test A.

ELECTRICAL

The vessel suffered minor heat and shock damage. There was no damage indicative of any general weakness in electrical equipment.

V. Any preliminary general or specific recommendations of the inspecting group.

HULL

None.

MACHINERY

None.

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USS CATRON (APA71)



## ELECTRICAL

Although the damage is light, it indicates that wherever possible equipment should not be exposed directly to heat blast, and the areas of exposed light equipment should be reduced as much as practicable.

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USS CATRON (APA71)

# TECHNICAL INSPECTION REPORT

## OVERALL SUMMARY

### I. Target Condition After Test.

#### (a) Drafts after test; general areas of flooding, sources.

##### HULL

There was no flooding, hence no change in drafts or list.

##### MACHINERY

No data taken by machinery group.

##### ELECTRICAL

The drafts and list were not observed. No flooding occurred.

#### (b) Structural damage.

##### HULL

The only structural damage consists of distortion of the deckhouse side and deck plating on the upper and superstructure decks, frames 70, to 90, port. This damage was caused by fire.

##### MACHINERY

No comment.

##### ELECTRICAL

There was no structural damage noted that affected electrical equipment.

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U.S.S. CORTLAND (APA 75)

(c) Other damage.

#### HULL

Not observed.

#### MACHINERY

A fire burned up two boats nested at frame 60 port, main deck. The fire damaged the motor of No. 2 davit. There is no other damage to machinery.

#### ELECTRICAL

Electrical damage as follows occurred as a result of fire:

1. Cable supplying general lighting in officer's wardroom had its insulation burned off.

2. Cable supplying power to two bracket fans, one in the wardroom and one in the officer's stateroom on the deck above had their insulation burned off. The fans were destroyed.

3. Cable to LMC general announcing reproducer in the wardroom had its insulation burned off. The reproducer was also burned and rendered inoperable.

4. Insulation burned off the cable to the davit limit switch.

5. Three lighting fixtures, one in a stateroom and two in the wardroom, were destroyed by the fire. One lighting circuit junction box in the stateroom was destroyed.

#### II. Forces Evidenced and Effects Noted.

(a) Heat.

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U.S.S. CORTLAND (APA75)

## HULL

Heat from about 270 degrees relative caused extensive scorching of exposed cordage but practically no damage to paint. Faint signs of blistering were found on the forward stack.

## MACHINERY

Paint on the exposed side of deck machinery was scorched.

## ELECTRICAL

There was slight evidence of radiant heat on the port side forward. This heat caused no damage to electrical equipment. Radiant heat probably started the boat fire which damaged electrical equipment as a secondary effect.

(b) Fires and explosions.

## HULL

Fire damage was extensive, destroying two LCVP's, warping adjacent structural plating, darkening paint in compartments, rendering useless an electrical junction box, and hatch tarpaulins for #1 and #2 hatches.

It is believed that the fire started by direct heat radiation upon the fire hose chafing gear on the #2 davit bellygripe and spread to the boats and to the vessel. Similar chafing gear on adjacent davit gripes showed scorching almost to the burning point. The fire completely gutted both LCVP's and heat from the fire warped the 01 and 02 decks and deckhouse plating between frames 70 - 90. Fire spread to the wooden cabinet in the officer's wardroom, bulkhead 83, port, by the heated structure and caused blackening of internal paint work in the wardroom and the burning of an electrical junction box, located on bulkhead 83. Two staterooms on the 02 deck level were fired by the ignition of wooden berth moldings from the heated deckhouse side.

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U.S.S. CORTLAND (APA75)

About 10 square feet of #1 hatch tarpaulin and almost 6 square feet of #2 hatch tarpaulin burned. It is felt that these fires may have been caused by burning fragments from the boat fire.

#### MACHINERY

A fire of unknown origin burned out two boats nested at frame 60, port, main deck.

#### ELECTRICAL

Fire at #2 boat davit between frames 72-83 on the port side of the 01 deck spread to the officer's wardroom and to one officer's stateroom on the 02 deck. This fire caused all of the damage that occurred to electrical equipment as a result of this test. There was no evidence of explosion.

(c) Shock.

#### HULL

None.

#### MACHINERY

No evidence.

#### ELECTRICAL

There was no evidence of shock to electrical equipment.

(d) Pressure.

#### HULL

The only evidence of damage caused by pressure is the slight dishing of certain sheet metal items.

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U.S.S. CORTLAND (APA75)

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure affecting electrical equipment.

(e) Effects peculiar to the Atom Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

There were no effects noted that are considered peculiar to the Atomic Bomb other than radioactivity and the intensity of the radiant heat.

III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

HULL

Not observed.

MACHINERY

The fire mentioned above damaged the motor of No. 2 Welin davit, making the davit inoperable. The davit mechanism and the davit itself are undamaged. There is no other damage affecting machinery.

SECRET

U.S.S. CORTLAND (APA 75)

## ELECTRICAL

There was no effect on the ship's electric plant other than the slight inconvenience due to the loss of lighting in the wardroom and in one stateroom, the loss of the one speaker and the loss of two bracket fans. There was no effect on ship control.

- (b) Effect on gunnery and fire control.

## HULL

Not observed.

## MACHINERY

No comment.

## ELECTRICAL

None.

- (c) Effect on watertight integrity and stability.

## HULL

None.

## MACHINERY

No comment.

## ELECTRICAL

None.

- (d) Effect on personnel and habitability.

## HULL

None.

SECRET

U.S.S. CORTLAND (APA75)

## MACHINERY

It is not believed that the test would have had any effect on personnel below decks. Habitability was not affected.

## ELECTRICAL

Except for the effects of radioactivity, it is considered that personnel and habitability would not have been affected by the test.

(e) Effect on fighting efficiency.

## HULL

None.

## MACHINERY

Inoperability of one Welin davit would reduce by 25% the ability of the vessel to lower boats, which is important to the military efficiency of a transport. However, this was caused by secondary effects of the test. The test had no direct effect on the fighting efficiency of this vessel as far as machinery is concerned.

## ELECTRICAL

The fighting efficiency of the vessel would not have been affected by this test unless personnel casualties resulted from radioactivity.

## IV. General Summary of Observers' Impressions and Conclusions.

## HULL

Had this ship been manned, the fires could have been extinguished and little damage would have resulted.

SECRET

U.S.S. CORTLAND (APA75)



## MACHINERY

The CORTLAND was outside the effective range of the explosion in Test A.

## ELECTRICAL

Due to the distance of this vessel from the center of the blast, there was no direct effect on electrical equipment. Had personnel been on board, the fire could have been controlled without damage to electrical equipment.

## V. Preliminary Recommendations.

### HULL

The displacement of cargo hatch closures on this ship on the fringe of the target array indicates the necessity of attention to the design of more adequate closures.

### MACHINERY

None.

### ELECTRICAL

None.

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## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

(a) Drafts after Test; list; general areas of flooding, sources.

No flooding occurred.

Drafts before and after Test:

Forward, 9'6"      Aft, 17'6"      List, 0°

(b) Structural damage.

#### HULL

Major structural damage occurred in the forward and after cargo hatch areas and in the bridge structure. Distortion of structure is much more severe in the forward cargo hatch area than in the after cargo hatch area. In the forward hatch area, the longitudinal girders are deflected, spread, and tilted at the upper, main, and first platform deck levels. The upper deck in way of the forward cargo hatch is dished 20 inches, starboard, and 16 inches, port. The main deck and first platform in this area are deflected similarly but to a lesser degree. Deck dishing in way of the after cargo hatch reaches a maximum of six inches.

The forward face of the superstructure is badly dished, the bridge wings are lifted, and the bulwarks are torn. All weather bulkheads facing forward, port and starboard, are dished. Blast damage diminishes from forward to aft and from the topmasts downward. Blast damage to masts, booms, and boat davits is severe.

Damage to joiner bulkheads and furniture is considerable in the forward part of the superstructure, due principally to the distortion of the forward bulkhead of the bridge structure and its associated longitudinal bulkheads. The most serious structural

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damage in the superstructure occurs within the five frame spaces immediately aft of bulkhead 59.

Structural damage in interior spaces is negligible except in the cargo hatch areas. Bulkheads surrounding the hatch areas are moderately dished. Joiner bulkheads in these areas are damaged by pressure which came down through the cargo hatches. All hatch battens, strongbacks, and pontoon type hatch covers were blown into the holds with the exception of one pontoon cover at the main deck level in the after cargo hatch.

Essentially the only damage to the shell plating is a wrinkle at frames 45-48, starboard, which extends from the upper deck to below the waterline. This shell damage, together with the damage to decks and longitudinal girders in the forward cargo hatch area, constitutes a serious reduction in strength in way of the forward cargo hatch.

#### MACHINERY

The outer casings of both stacks were badly crushed. The inner casing of the after stack was considerably dished and was torn open on the forward side. Supports, both internal and external, of the after stack failed, leaving the stack in place but in a precarious position. Nos. 2 and 4 (port) Welin davits received severe structural damage.

#### ELECTRICAL

The ship received considerable structural damage as a result of this test. The only damage to the ship's electrical equipment due to this structural damage was a few cables cut when the bulkheads on which they were mounted gave way. Special electrical test equipment was damaged by falling hatch covers.

(c) Other damage.

#### HULL

Propulsion and auxiliary machinery are unaffected by the Test. Ship control is affected slightly by damage to instruments at the

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secondary conning station. Pilot house instruments remain essentially intact and steering machinery is unaffected. Fire control is reduced in effectiveness by a damaged 40 mm director foundation on the after deckhouse top. Gunnery and electrical equipment is essentially undamaged. Electronics equipment is unaffected except for carrying away of radio and radar antennae. Interior communications are undamaged.

#### MACHINERY

No. 1 boiler casing seams were opened at the top where the boiler casing is welded onto the uptake. Both smoke periscope sight reflecting units were ruptured. The after stack was severely damaged. There was moderate damage to the uptakes. The forward starboard cargo winch was torn loose from its foundation. The port Welin davits (nos. 2 and 4) were severely damaged structurally. The electric controller of no. 3 Welin davit was torn loose from the bulkhead. The starboard side of the firemain loop was opened at three places just below the upper deck. There was a large amount of scattered minor damage to piping, electric drinking fountains, etc.

#### ELECTRICAL

Principal electrical damage consisted of the following:

1. Both 24 inch searchlights and one 12 inch searchlight were demolished.
2. Approximately six lighting and fire alarm circuit cables for both cargo holds were ruptured.
3. Two gyro compass repeaters were missing and another repeater was knocked from its stand.
4. The port 6 MC bull horn was missing.
5. The anemometer cups were blown off.
6. One boat davit controller was knocked off the bulkhead.

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7. A few lamps were broken.
8. A few sound powered telephones were rendered inoperable.
9. Special Bureau of Ships, code 660, test material in the forward cargo hold was damaged by falling hatch covers.

II. Forces evidenced and effects noted.

(a) Heat.

HULL

The heat wave struck the ship at an angle of approximately 350 degrees relative, and at an elevation of about 30 degrees.

Paint damage is confined principally to areas facing forward and to port and diminishes in severity from forward to aft and from the topmasts downward. A few athwartship surfaces facing aft have scorching about one foot inboard from the port side. Fire hoses are darkened and frayed. Manila rope appears dried out and wire rope boat falls appear to have all the grease burned.

MACHINERY

Paint on the port side of exposed machinery was badly scorched and blistered.

ELECTRICAL

Radiant heat from the port bow scorched paint on exposed electrical equipment and cables. This heat was not of sufficient duration to render any electrical equipment inoperable.

(b) Fires and explosions.

HULL

No fires or explosions occurred on this ship.

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## MACHINERY

No evidence.

## ELECTRICAL

There was no evidence of fires or explosions.

(c) Shock.

## HULL

Effect of shock is slight. Pipe berths in troop berthing compartments aft are thrown from their hooks. Electric light globes and bulbs suffered little damage anywhere in the ship. Some equipment was thrown off bulkheads but this is attributable to either the direct effect of air blast or deflection of the structure. Breakage of a nipple on a boat fueling line and separation of pipe flanges in flushing and fire mains are the result of shock. No shock damage to machinery resulted from the test.

## MACHINERY

No evidence.

## ELECTRICAL

There was evidence that the vessel received considerable shock since some lamps, steamtight globes and fire alarm thermostats were broken.

(d) Pressure.

## HULL

Air blast pressure came from approximately 350 degrees relative, at an elevation of about 30 degrees. The areas most severely affected are the forward face of the bridge structure, the forward and after cargo hatch areas, and weather bulkheads facing forward and to port and starboard. In general, dishing of

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longitudinal weather bulkheads facing to starboard is as severe as dishing of bulkheads facing to port. Damage in the starboard main deck passageway is more severe than in the port passageway. Reflection of pressure from the forward face of the bridge structure into the forward cargo hatch area is apparent. The superstructure afforded considerable shielding of the after cargo hatch area.

Dishing of both 7 1/2 lb and 10 lb plating is general.

Top masts and booms proved particularly vulnerable to air blast. All cargo booms secured to the foremast and mainmast are badly bent or buckled.

The ship's speed would have been materially reduced pending repairs to the boiler casing in the forward machinery space. If the ship had been in heavy seas, she would be jeopardized because of serious reduction of strength in way of the forward hold.

#### MACHINERY

Blast pressure, and the whipping motion of the ship following the blast, are believed to have caused all the damage to machinery. The blast came from the port side.

#### ELECTRICAL

This vessel was subjected to high pressures (air blast). This is evidenced by the searchlights, davit controller, and bull horn being blown from their mountings and by light metal bulkheads being carried away. Most of the electrical damage was a result of the air blast.

(e) Effects peculiar to the Atomic Bomb.

#### HULL

Exclusive of radiological features, the atomic bomb, at this range, presents a problem of large scale simultaneous exposure to heat, blast, pressure, and shock.

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## MACHINERY

A blast pressure of this magnitude is apparently peculiar to the Atom Bomb.

## ELECTRICAL

The loss of residual magnetism of #1 Ship Service generator may have been due to an atomic bomb effect.

### III. Results of Test on Target.

- (a) Effect on machinery, electrical, and ship control.

## HULL

The effect of Test A on machinery and electrical equipment is negligible. Ship control is affected only to the extent of damage to instruments at the secondary conning station.

## MACHINERY

Both boilers could have continued in operation with an estimated reduction in efficiency of 50% forward, 25% aft. #1 boiler was repaired by the ship's force in about 2 hours and is now fully operable. The after stack was seriously weakened and would probably have fallen over if heavy weather had been encountered, in which case maximum load on the after boiler would be reduced to 50% or less of normal. Damage to the firemain considerably lessened the effectiveness of this system. Three of the four Welin davits were made inoperable and two are believed to be beyond repair. This reduces the ability of the vessel to lower boats by 75%.

## ELECTRICAL

Electrically, the damage which occurred as a result of the test had slight effect on the operation of the ship's electrical plant. All propulsion and boiler auxiliaries were operable. Had the #1 AC ship's service generator been operating at the time of the bomb explosion, it would not have lost its residual

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magnetism. Since the generator could be easily repaired by the ship's force and since there is a standby generator, the temporary loss of this generator would not affect the operation of the vessel. The most serious effect on the electric plant was the loss of both 24 inch searchlights which were damaged beyond repair. The loss of a few sound powered telephones, the port 6MC bull horn, the 12 inch signal searchlight, and the lighting cables would slightly impair the operation of the ship. The ship could be operated almost indefinitely without these items at only slightly reduced efficiency. Temporary lights could have been rigged by the ship's force to replace those lost.

Secondary ship's control was practically demolished. This control station is seldom used except when the primary control stations is inoperable. The ship could therefore, continue to operate, controlled by the normal ship's control station.

(b) Effect on gunnery and fire control.

#### HULL

Gunnery appears essentially unaffected. Fire control is affected by dislocation of the 40mm director foundation on the after deck house top and by possible severance of electric cables interconnecting the fire control stations.

#### MACHINERY

No comment.

#### ELECTRICAL

The only damage to gunnery and fire control equipment was to that equipment secured to the masts. This consists of radar equipment which is covered by the electronics report.

(c) Effect on watertight integrity and stability.

#### HULL

Watertight integrity and stability are unaffected. No damage to main transverse bulkheads exists below the main deck.

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## MACHINERY

No comment.

## ELECTRICAL

Watertight integrity was not affected by damage to electrical equipment. No electrical equipment shifted sufficiently to affect stability.

(d) Effect on personnel and habitability.

## HULL

The commanding officer estimates that 50 per cent of the topside personnel would be serious casualties from the effects of heat, blast, flying debris, and radioactivity and that 20 per cent of personnel in the interior of the ship would suffer injuries. Some machinery space casualties could be expected from boiler flarebacks.

Habitability is affected, by damage to ventilation ducts in the forward and after cargo hatch spaces, by temporary disarrangement of berths and lockers, and by obstruction of passages by damaged joiner bulkheads.

## MACHINERY

It is estimated that there would have been few if any, casualties among personnel below decks. Habitability was slightly reduced temporarily by damage to piping and the general disarrangement of the ship.

## ELECTRICAL

The personnel on this vessel might have been affected by radioactivity, however, the extent of these effects is unknown. Disregarding radioactivity, it is considered that all exposed topside personnel would have been casualties due to the flash and air blast. There would also have been casualties around the cargo holds due to structure distortion and due to falling hatch covers. From an electrical standpoint, casualties might have resulted from electrical equipment such as the searchlights and the bull horn becoming missiles.

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Electrically, the only effect on habitability was the slight inconvenience due to the lighting failures.

(e) Effect on fighting efficiency.

#### HULL

Fighting efficiency is reduced by damage to the port after 40mm director foundation and by damage to radio and radar antennae. The ship could not carry out her mission in amphibious operations because of damage to all cargo booms and the inoperability of three of the four sets of boat davits.

#### MACHINERY

Damage to the Welin davits, reducing the vessel's ability to lower boats, would seriously reduce her efficiency as a transport in certain tactical situations. It is to be noted that if the ship had her normal complement of boats aboard, many of these would have been wrecked. It is estimated that maximum speed was reduced to about 6 knots for 2 hours, and that after temporary repairs to the forward boiler speed could be built up to about 13 knots (16 knots is designed speed). It is estimated that approximately 25 days' work at a shipyard would be required to restore all machinery to normal operating condition.

#### ELECTRICAL

Due to personnel casualties and due to the damage to the vessel, its fighting efficiency was greatly reduced. Electrically, the effects were slight. Disembarkation would have been hampered by the loss of the davit controller, however, this damage could have been repaired by the ship's force in a few hours. Night cargo handling operations would have been hampered by the loss of the cargo lights. It is considered that the ship could operate electrically at approximately 90% efficiency.

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#### IV. General Summary.

##### HULL

This ship proved to be extremely vulnerable to the affects of air blast on topside structure, masts, booms, rigging, and cargo hatch areas. The discontinuity of structure in way of the cargo hatches is likely to contribute materially to reduction in local strength as a result of proximity to an air burst Atom Bomb.

##### MACHINERY

The CRITTENDEN was apparently near the edge of the lethal range of this type of attack for vessels of her type. A slightly greater amount of damage to the boilers and stacks would have immobilized the vessel.

##### ELECTRICAL

This vessel received the most damage of any of the transports that survived the first atomic bomb test. Although the ships hull received considerable damage there was very little electrical damage. Part of the electrical damage that occurred was due to the failure of associated hull equipment.

#### V. Preliminary Recommendations.

##### HULL

(a) Increase in strength in way of cargo hatch areas is necessary and greater resistance to blast pressure is required for cargo hatch closures.

(b) Long spans between stowage cradles for cargo booms should be eliminated.

(c) Boat handling arrangements should be redesigned to eliminate broad surfaces exposed to blast pressure. Boats should be housed below the weather deck or in protective inclosures.

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(d) Top masts should be eliminated and radar and radio antennae should be replaceable by spares.

(e) Plating less than 10 lbs. in weight should not be used in structure exposed to air blast. Stacks should be of less projected area. Fire control and ship control stations should be spherical or cylindrical inclosures, preferable streamlined with the surrounding structure. Bridge wings should be eliminated.

(f) Life rafts, and loose topside gear in general, should be more securely attached to the ship's structure.

(g) Studies should be conducted to determine the most suitable paints for resisting heat.

#### MACHINERY

Stacks should be made more resistant to blast pressure.

Piping, especially main lines, should be so located that it is not likely to be damaged by deflection of decks and bulkheads.

#### ELECTRICAL

(a) It is recommended that consideration be given to the redesign of the 24 inch searchlights to give them more resistance to air blast. This is considered necessary to give them comparable strength to other electrical equipment.

(b) It is recommended that the gimbal and binnacle pins on gyro compass repeaters be lengthened to prevent the repeaters from being freed from their mounting stands.

(c) It is recommended that consideration be given to mounting equipment such as controllers on some sort of mounting pads or straps so that some bulkhead distortion can occur without damage to the equipment.

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(d) It is recommended that where possible, cable be run along beams instead of along light metal joinder bulkheads. It is considered that most of the damage to cables that occurred on this vessel could have been avoided if more consideration had been given to the routing of the cable.

(e) It is recommended that some means of pinning the 12 inch signal searchlights in their sockets be devised to prevent them from being jarred or blown from their sockets.

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## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; list; gneral areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

#### HULL

Weather bulkheads in the superstructure facing forward and to port are generally dished. Maximum dishing is about four inches and occurs in the pilot house forward bulkhead, the port bulkhead of the pilot house and chart room, and in bulkhead 88 which forms the forward face of the 20 nm clipping room. Deflection of longitudinal bulkheads diminishes from forward to aft. Distortion of the forward bulwarks is severe at the navigating bridge and signal bridge levels. Dishing of decks in the superstructure is slight.

The foremast is essentially undamaged but the port cargo boom, stowed vertically against the foremast, is bent in two places. The main topmast, which supports the air search radar screen is bent aft and to starboard. The signal mast and yard arm located on the forward stack are bent aft. Nearly all radio antennae and signal halyards are down.

The outer casing of the after stack is severely dished.

The upper deck in way of the forward cargo hatch is permanently deflected approximately five inches, port and starboard, and the hatch longitudinal coamings are bowed outboard four inches at the upper edge. Hatch battens, strongbacks, and pontoon covers are blown into the hold. The main deck in the forward cargo hatch area is deflected four inches, starboard and a lesser amount, port. The first platform is uninjured.

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In way of the after cargo hatch the upper deck is deflected approximately two inches, port and starboard. The main deck is not deflected. Hatch battens, pontoon covers and a strongback fell into the hold.

Damage in the interior of the ship is superficial and is confined to sheet metal and joiner bulkheads in main deck areas adjoining the forward and after cargo hatch spaces.

#### MACHINERY

The outer casings of both stacks were considerably pushed in by blast pressure and the galley smokestack was flattened between the casings of the after stack. Both Welin davits on the port side were severely damaged structurally. No. 4 davit (after port) is considered to be beyond repair.

#### ELECTRICAL

The director shields at frame 27, one joiner bulkhead at frame 104 on the port side and one joiner bulkhead at frame 109 on the starboard side carried away and severed electrical cables, rendering their associated equipment inoperable.

(c) Other damage.

#### HULL

No damage of any consequence occurred to machinery, electrical, electronics fire control, or gunnery equipment.

#### MACHINERY

One electric drinking fountain was severely damaged. There is no other damage to machinery. The machinery of both port Welin davits is undamaged and fully operable.

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## ELECTRICAL

Principal electrical damage consisted of the following:

1. The bases were distorted on both 24 inch searchlights. The port searchlight was rendered inoperable.
2. Three gyro repeaters were dislodged from their gimbal rings. However, no material damage resulted to these repeaters and when they were replaced, they were all operable.
3. The port 12 inch signal searchlight was blown over the side.
4. Number 2 fuel oil service pump was rendered inoperable due to a severed cable in its control circuit.
5. The fire alarm circuit for the after cargo hold was rendered inoperable due to a severed cable.
6. The Anemometer cups were carried away by the air blast.
7. Some lamps were broken, mainly on the port side above the main deck.

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

## HULL

The heat of the bomb explosion came from approximately 310 degrees relative. Paint is uniformly and heavily scorched with little blistering over large areas facing toward the blast. Vertical surfaces are much more severely scorched than are horizontal surfaces.

## MACHINERY

Paint on the port side of exposed machinery was scorched and blistered.

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## ELECTRICAL

Radiant heat blistered paint on exposed electrical equipment and cable. None, however, was rendered inoperable from this radiant heat.

### (b) Fires and explosions.

## HULL

No explosions occurred. A number of small fires, which had negligible effect on structure, occurred in topside areas in wiring insulation, cocoa matting fenders, manila rope, and fire hoses. The cause of these fires was the direct effect of heat radiation from bomb explosion.

## MACHINERY

No evidence.

## ELECTRICAL

A small fire on the starboard side of the forward deck house at frame 27, destroyed the insulation on a sound powered telephone cable and a call bell cable. It is also believed that this fire contributed to the damage to cables on the lower part of the foremast.

### (c) Shock.

## HULL

Shock effect is slight and resulted in no greater damage than the jumping of the pelcruses out of their pedestals.

## MACHINERY

No evidence.

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## ELECTRICAL

No evidence of damage to electrical equipment as a result of shock.

(2) Pressure.

## HULL

Blast pressure struck this ship from a relative bearing of approximately 310 degrees. Areas most severely affected are the forward face of the bridge structure, weather bulkheads facing forward or to port, the upper deck in way of the forward and after cargo hatches, and the port boat davits. Panel dishing is most severe in forward areas of the superstructure and in the upper deck forward. The critical weight of superstructure plating generally appears to be in excess of 10 lbs. Bulwarks and lookout tubs of 7 1/2 lb. plate are distorted by blast pressure; similar shields of 10 pound plate effectively resisted the blast.

## MACHINERY

Blast pressure pushed in the outer casings of both stacks, flattened the galley smokepipe, slightly bent the steering wheel in secondary conn, and severely damaged the two port Welin davits. The blast apparently came from aft of the port beam.

## ELECTRICAL

Air blast is considered responsible for the following electrical damage.

1. The distortion of both 24 inch searchlight bases.
2. The smashing of five (5) cargo handling lights.
3. The freeing of three (3) gyro repeaters from their gimbal rings.

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4. The tearing of one reproducer from its mounting.
  5. The bent forward 6 MC bull horn.
  6. The cracking of the dial window on the Rudder Angle Indicator at the Secondary Control Station.
  7. The anemometer cups carrying away.
- (e) Effects peculiar to the atomic bomb.

#### HULL

No comment.

#### MACHINERY

Blast pressure of such magnitude at such a distance from an explosion is apparently peculiar to the atom bomb.

#### ELECTRICAL

There were no effects noted that are considered peculiar to the atomic bomb other than radioactivity and the intensity of the radiant heat.

### III. Results of Test on Target.

- (a) Effect on machinery, electrical, and ship control.

#### HULL

Ship control is slightly affected by the collapse of the master magnetic compass stand.

#### MACHINERY

Both port Welin davits are inoperable because of structural damage. Neither can be repaired by the ship's force.

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The after one is probably beyond repair. One electric drinking fountain is probably beyond repair. Otherwise, there was no damage that affected operation of machinery.

#### ELECTRICAL

The effects on electrical equipment and ship's control were slight. Except for the damage to the searchlights and the wind intensity system, emergency repairs could have been made to all items by the ship's force without serious difficulty.

(c) Effect on gunnery and fire control.

#### HULL

No comment.

#### MACHINERY

No comment.

#### ELECTRICAL

Electrically, there was no effect on gunnery or fire control.

(c) Effect on watertight integrity and stability.

#### HULL

None.

#### MACHINERY

No comment.

#### ELECTRICAL

None.

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(d) Effect on personnel and habitability.

HULL

Personnel exposed in superstructure areas would have been subject to injury from air blast and heat. It is estimated that personnel in enclosed spaces in the bridge area and below decks, except in the forward and after cargo hatch areas, would have been reasonably safe from injury from blast. Some casualties might have occurred in the machinery spaces due to boiler flare-backs.

Habitability is temporarily slightly affected by disarrangement of berths in the cargo hatch areas, by debris in those areas, and by damaged sheet metal bulkheads obstructing passageways.

MACHINERY

There might have been some personnel casualties from blast pressure entering through the cargo hatches. The cover panels of both of these hatches were blown in and blast pressure was able to enter part of the interior of the ship. Otherwise, it is not believed that there would have been any personnel casualties below deck. Casualties among exposed personnel would have been high. Habitability was not affected.

ELECTRICAL

Personnel and habitability not affected from electrical failures. Effects from radioactivity are not known. It is considered that there would have been casualties from the air blast and radiant heat. There was no effect on habitability.

(e) Total effect of fighting efficiency.

HULL

Fighting efficiency would probably have been seriously impaired by personnel casualties in topside gunnery and fire control stations. Effectiveness of the ship in amphibious operations would be materially reduced by the damage to the port davits, the probable

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damage to all boats stowed on the port side, and the partial crippling of one cargo boom.

#### MACHINERY

Damage to the two port Welin davits would have reduced by 50% the ability of the ship to lower boats. As she is an attack transport, this would have considerably reduced her military effectiveness. It should also be noted that if the ship's normal war allowance of boats had been aboard, a number of them would have been wrecked. Otherwise, the test had no effect on fighting efficiency.

#### ELECTRICAL

Negligible, unless radioactivity and blast caused sufficient personnel casualties to affect the fighting efficiency.

#### IV. General Summary of Observers' Impressions and Conclusions.

#### HULL

At the distance of this ship from an air burst, it can be expected that moderate to severe dishing of weather bulkheads and decks, and that damage to boat davits and cargo booms, topmasts, radar screens, and radio antenna will occur. Many casualties to personnel in exposed topside locations seems certain. The overall ability of the ship to carry out an amphibious attack mission would be materially reduced.

#### MACHINERY

Deck equipment near the side of a vessel, especially of a type having long structural members supported only at one end, such as a Welin davit, appears to be peculiarly susceptible to damage by blast pressure.

#### ELECTRICAL

Exposed electrical equipment received approximately 13 lbs. per square inch pressure. In view of the resulting damage to

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such equipment as the pelorus, stands and searchlights, it is considered design modifications are necessary on such items to increase their resistance to damage by air pressure.

#### V. Preliminary Recommendations.

##### HULL

The strength should be augmented in way of structural discontinuities in the forward and after cargo hatch areas. Plating of less than 10 lbs. weight should not be used in areas exposed to blast pressure.

Boat davits should be redesigned to offer less area to blast pressure and to prevent dislodging of the rollers from the roller tracks. Provision should be made for stowage of boats below decks or behind shields as a protection against air blast and heat.

Personnel in gunnery and fire control stations should be protected by shields of not less than 10 lbs. plating weight, preferably streamlined with the surrounding structure. Bridge wings and overhangs, generally, should be eliminated.

Topside structures built up on high foundations should not be installed, because of the strong couple resulting from blast pressure on the structure.

Hatch covers should be made less vulnerable to distortion and dislodging by blast pressure. Cargo hatches should be trunked through the living spaces in the hatch areas, for protection of personnel.

Fire hose, rope, and other inflammable materials exposed to bomb blast should be housed in metal lockers or other non-inflammable covering.

Automatic release mechanisms for life rafts should not be pressure operated.

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Topmasts should be eliminated and radar screens should be made retractible or readily replaceable by spares.

Stack outer casings should be constructed of heavier plating and reduced in area.

#### MACHINERY

It is recommended that a study be made to determine whether Welin davits can be made more resistant to blast pressure.

#### ELECTRICAL

(a) It is recommended that the 24 inch searchlights be redesigned to have resistance to air blast comparable with that of other electrical equipment.

(b) It is believed a great deal of the damage to the pelorus repeaters could be eliminated by lengthening the gimbal pins which hold the repeater, and substituting threaded binnacle pins with locking nuts for the type binnacle pins being used at the present.

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## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

#### HULL

The after bulkheads of the superstructure and the port bulwarks on the superstructure and navigating deck level are dished slightly. There is slight dishing of weather doors on the port side of the superstructure near the after end. Miscellaneous items located in the superstructure and fabricated of plating weighing less than five pounds are distorted. The outer casings of both stacks are somewhat dished.

#### MACHINERY

The outer casing of the after stack was slightly dented. The sheet metal cover of one electric drinking fountain was blown off.

#### ELECTRICAL

Structural damage was not observed.

##### (c) Other damage.

#### HULL

There is no damage other than controller failure on one deck winch.

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## MACHINERY

The circuit breaker of #4 cargo winch was torn loose from the switchboard by the blast pressure. There was no other damage affecting the machinery of this vessel.

## ELECTRICAL

Damage to electrical equipment was confined to a small number of broken lamp bulbs, damaged searchlights and cargo lights, and a disabled cargo winch controller.

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

## HULL

Heat radiation came from about 200 degrees relative. Damage is slight and is confined to a single layer of paint in most cases. There is no deck scorching. Exposed vertical surfaces are scorched but not blistered. Painted wood surfaces suffered greater damage than comparable coatings on steel. Painted areas where drainage and rust was permitted to accumulate, are blistered. Several small fires were ignited in special U.S. Army equipment installed for test.

## MACHINERY

Paint was scorched and blistered on exposed surfaces. There was no other evidence of heat in machinery spaces or on exposed machinery.

## ELECTRICAL

The heat coming from the blast caused a slight exuding of the sheath through the armor of two unpainted cables on the main mast, and blistered paint on equipment directly exposed.

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(b) Fires and explosions.

HULL

With the exception of a burned bellygripe pad on No. 2 boat davit, all fires occurred in experimental equipment placed on board.

Fires on the forecastle deck included two cardboard boxed cartons of battle helmets, a cardboard box of buckle type artics, and cartons of U.S. Army Quartermaster clothing. The later fire seemed to have been started by either the anchor ball or the brass encased anchor light that had been hanging from the forestay overhead and fell into the test equipment.

A galvanized expanded metal rat cage was blown from a signal halyard to the signal bridge and burned the outline of the cage on deck where it fell. A life jacket placed over the cage is burned only where it came in contact with the metal cage.

Several turns of galvanized wire had been wrapped in a horizontal direction around a wooden box support for a lead box containing photographic film. The wooden box is severely burned where the wire made positive contact with the box.

Canvas covered chafing gear on No. 2 boat davit gripe is burned away where wire serving had been used, but is only moderately scorched elsewhere.

Several common characteristics of the above burned material were noted. All were metal objects of high surface mass ration. All of the objects were insulated from the ship; the metal helmets were insulated from each other by cardboard boxes; the buckled-type artics, by the cardboard box; the rat cage, by the signal halyard; the wire turns on the lead box support, by the box itself; and the wire serving on the gripe, by the canvas parcelling. It should be mentioned that other equipment on the forecastle in similar type cartons were not a cause of fire and that a box of laced-type rubber artics is untouched.

SECRET

USS FALLON (APA81)

## MACHINERY

There was no evidence of fires or explosions.

## ELECTRICAL

A minor fire occurred in a pile of Army Quartermaster Corps stores on the forecastle deck. The anchor light was burned from the forestay and fell to the deck in this area.

(c) Shock.

## HULL

There is no evidence of shock.

## MACHINERY

There was no evidence of shock.

## ELECTRICAL

A moderate amount of shock caused the breaking of a few lamp bulbs throughout the ship and some minor comparable damage.

(d) Pressure.

## HULL

The pressure wave emanated from about 200 degrees relative. Damage due to the air blast is slight. Exposed sheet metal is generally distorted. Superstructure plating is undistorted except on the after faces where it is very slightly dished. Exposed doors are dished slightly. The stacks are distorted slightly on the port side. The critical plating weight is about five pounds since plating above this weight is not damaged.

SECRET

USS FALLON (APA81)

## MACHINERY

Blast pressure slightly dented the outer casing of the after stack, blew off the sheet metal cover of one electric drinking fountain, and tore the circuit breaker of #2 cargo winch loose from the switchboard.

## ELECTRICAL

No certain indication of pressure was shown by any effects on electrical equipment. Two cargo lights of commercial manufacture had spot welded trunnion clips torn off by either the blast pressure or by shock.

- (e) Effects apparently peculiar to the atom bomb.

## HULL

If radioactivity is disregarded, the intensity of heat was the only peculiarity observed. The possibility of induced heating of ungrounded metals is discussed in (b).

## MACHINERY

None.

## ELECTRICAL

The heating of cable as mentioned above and the blistering of paint was due, apparently, to radiant heat emanating from the focus of the blast. This was the only effect noted as being peculiar to atomic explosions.

### III. Effects of Damage.

- (a) Effect on machinery, electrical, and ship control.

## HULL

No damage.

SECRET

USS FALLON (APA81)

## MACHINERY

No. 2 cargo winch was inoperable because the circuit breaker was torn loose from the switchboard. This was easily repaired by the ship's force. Otherwise, the test had no effect on machinery or ship control from a machinery viewpoint.

## ELECTRICAL

There was no effect on propulsion and ship control caused by damage to electrical equipment.

(b) Effect on gunnery and fire control.

## HULL

No damage.

## MACHINERY

No comment.

## ELECTRICAL

There was no effect on gunnery and fire control caused by electrical equipment damage.

(c) Effect on water-tight integrity and stability.

## HULL

No effect.

## MACHINERY

No comment.

## ELECTRICAL

No failure of electrical systems had any effect on water-tight integrity and stability.

SECRET

USS FALLON (APA81)

(d) Effect on personnel and habitability.

HULL

The habitability of the ship is unimpaired.

MACHINERY

It is not believed that there would have been any personnel casualties below decks if the ship had been manned. Habitability was not affected.

ELECTRICAL

There was no failure of electrical equipment that in any way affected the habitability of the vessel.

(e) Total effect on fighting efficiency.

HULL

The explosion would have had little, if any, effect on the fighting efficiency of the vessel.

MACHINERY

None.

ELECTRICAL

The fighting efficiency of the vessel would have been slightly reduced by the failure of the cargo winch controller, which would have slowed unloading.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

Damage is superficial. While injury might have been suffered by some personnel exposed topside, the vessel would be able to fulfill its mission.

SECRET

USS FALLON (APA81)



## MACHINERY

The FALLON was beyond the effective range of the explosion in Test A.

## ELECTRICAL

A blast of heat and a pressure wave struck the vessel causing only minor damage. A ship's force could have quickly repaired or neutralized the damage that did occur in the electrical equipment.

### V. Preliminary General or Specific Recommendations of Inspection Group.

## HULL

Light sheet metal enclosures, especially flag bags, appear to be the items most easily affected by air blast, even at considerable distance from the explosion. Flag bags, lockers, and similar equipment now exposed on the superstructure, should be built into the deck house proper.

## MACHINERY

None.

## ELECTRICAL

The damage to electrical equipment is not of a nature or amount to call for any recommendations.

SECRET

USS FALLON (APA81)

# TECHNICAL INSPECTION REPORT

## OVERALL SUMMARY

### I. Target Condition After Test.

#### (a) Drafts after test, general areas of flooding, sources.

There is no flooding, hence no change in drafts or list.

#### (b) Structural damage.

##### HULL

There is no damage to main structural members.

The after side of the port flag bag and the after bulkhead of the signal shack, both fabricated from sheet metal, are dished.

##### MACHINERY

No comment.

##### ELECTRICAL

There was no adverse effects on any electrical equipment.

#### (c) Other damage.

##### HULL

No comment.

##### MACHINERY

A few small salt water lines, already badly corroded, were broken. There is no other damage to machinery, all of which was operated after Test A.

SECRET

USS FILLMORE (APA83)

## ELECTRICAL

The main electric plant, ship control, fire control and electrical equipment associated with gunnery were undamaged and operable.

### II. Forces Evidenced and Effects Noted.

#### (a) Heat.

##### HULL

Heat caused slight blistering of paint and scorching of lines.

##### MACHINERY

No evidence.

## ELECTRICAL

1. This vessel was subjected to a flash of radiant heat coming from the port quarter at an elevation of approximately 25°. This heat was sufficient to scorch manila lines, life rafts and fire hose.

2. There was no damage to electrical equipment except slight blistering of paint on electric cable on afterside of foremast and main mast.

#### (b) Fires and explosions.

##### HULL

Swabs in racks on top of the deckhouse burned. There were no other fires.

##### MACHINERY

No evidence.

SECRET

USS FILLMORE (APA83)

## ELECTRICAL

Small fires were ignited by radiant heat in two swabs left on forecastle and a wood instrument box on fantail. These fires caused no damage to electrical equipment.

(c) Shock.

## HULL

None.

## MACHINERY

No evidence.

## ELECTRICAL

There was no damage to electrical equipment as a result of shock.

(d) Pressure.

## HULL

The only evidence of blast is in the dishing of the sheet metal port flag bag and signal shack bulkhead.

## MACHINERY

Blast pressure apparently set up a whipping motion of the ship which broke a few small salt water pipes (already badly corroded).

## ELECTRICAL

Air blast pressure coming from port quarter forced a portable mounted 500 watt flood light against bulkhead and broke the lens. There was no other damage to electrical equipment.

SECRET

USS FILLMORE (APA83)

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

Other than radioactivity, radiant heat and air blast pressure were the effects noted apparently peculiar to the atom bomb.

III. Results of Test on Target.

(a) Effect on machinery, electrical and ship control.

HULL

None.

MACHINERY

The test had no effect on operation of machinery.

ELECTRICAL

No effect.

(b) Effect on gunnery and fire control.

HULL

None.

SECRET

USS FILLMORE (APA83)

**MACHINERY**

No comment.

**ELECTRICAL**

No effect.

(c) Effect on watertight integrity and stability.

**HULL**

None.

**MACHINERY**

No comment.

**ELECTRICAL**

No effect.

(d) Effect on personnel and habitability.

**HULL**

Exposed personnel might have received flash burns.

Habitability is unaffected.

**MACHINERY**

The test would have had no effect on personnel below deck and did not affect operability.

**ELECTRICAL**

1. Other than radioactivity, it is estimated that personnel at topside exposed stations would have suffered minor to moderate flash burns from radiant heat and possible bruises resulting from blast pressure wave.

**SECRET**

**USS FILLMORE (APA83)**

2. Habitability has in no way been affected.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

The fighting efficiency of this vessel has not been impaired as a result of any material damage.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

The FILLMORE was outside the effective range of the explosion during Test A.

ELECTRICAL

Due to the distance of this ship from the center of the burst, heat and blast of bomb was not sufficient to cause any material damage to electrical equipment.

V. Any Preliminary General or Specific Recommendations of the Inspecting Group.

HULL

No comment.

MACHINERY

None.

ELECTRICAL

None.

SECRET

USS FILLMORE (APA83)

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding and consequently no change in drafts or list.

##### (b) Structural Damage.

#### HULL

About forty percent of the upper deck hatch pontoons for cargo hatch No. 1 and about twenty percent for hatch No. 2 lifted and fell to the deck below without damage. There is a slight dishing and distortion of a gear locker installed by the ships force under the 20mm gun foundations at frame 133. A sheet metal locker on the port bridge wing and the port flag bag are slightly dished on the exposed face. A gear locker on the starboard side of the signal bridge has sprung doors and the top is bulged. A plywood motion picture projection booth installed by the Ship's Force has suffered a failure in a screwed joint at about mid-height on the port side.

#### MACHINERY

No comment.

#### ELECTRICAL

None observed.

SECRET

USS GASCONADE (APA85)



(c) Damage.

HULL

No damage.

MACHINERY

There was no damage to machinery of this vessel from Test A.

ELECTRICAL

No electrical equipment was damaged or rendered inoperable as a result of the test.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

There is very little evidence of heat damage. Paint on the exterior hull forward on the port side is lightly scorched. There are faint traces of paint scorching on cylindrical surfaces normal to the radiation source. These traces indicate that heat emanated from a point about 300 degrees relative. Exposed manila lines are lightly scorched.

MACHINERY

No evidence.

ELECTRICAL

There was slight evidence of radiant heat along the port side forward. This heat was of insufficient intensity to cause any damage to electrical equipment.

SECRET

USS GASCONADE (APA85)

(b) Fires and explosions.

HULL

There were no explosions. Three small fires, probably caused a canvas belly gripe cover.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of fires or explosions affecting electrical equipment.

(c) Shock.

HULL

There is no evidence of shock damage.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock to electrical equipment.

(d) Pressure.

HULL

The origin of the air blast wave was from a point bearing approximately 300 degrees relative. Pressure damage is very minor, and is limited to slight distortion of exposed sheet metal structures.

SECRET

USS GASCONADE (APA85)

### MACHINERY

There is no evidence of pressure on any part of the machinery installation. The stacks were carefully inspected and have no deformation.

### ELECTRICAL

There was no evidence of pressure on electrical equipment.

(e) Any effects apparently peculiar to the Atom Bomb.

### HULL

Other than radiation, no peculiar effects were observed.

### MACHINERY

None.

### ELECTRICAL

There were no effects noted that are considered peculiar to the atomic bomb other than radioactivity and the intensity of the heat wave.

### III. Effects of damage.

(a) Effect on machinery, electrical and ship control.

### HULL

No damage.

### MACHINERY

None.

SECRET

USS GASCONADE (APA85)

ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

No damage.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

No damage.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

The habitability of the vessel is unimpaired.

SECRET

USS GASCONADE (APA85)

## MACHINERY

The test had no effect on habitability and would have had no effect on personnel below decks.

## ELECTRICAL

There would have been no effect on personnel other than possible casualties from radioactivity and from the heat of the blast. Extent of radioactivity is unknown. It is considered that casualties from the heat of the blast would have been light. There was no effect on habitability other than radioactivity.

(e) Total effect on fighting efficiency.

## HULL

None. There is no impairment of structural strength or seaworthiness.

## MACHINERY

None.

## ELECTRICAL

Since it is considered that injury to personnel would not have been sufficient to prevent them from performing their duties, it is probable that there would have been no effect on the fighting efficiency of the vessel.

## IV. General Summary of Observers' Impressions and Conclusions.

## HULL

Damage is superficial. While some injuries might have been sustained by exposed topside personnel, the vessel would have been able to fulfill its mission.

SECRET

USS GASCONADE (APA85)

### MACHINERY

The GASCONADE was outside the effective range of the explosion during Test A.

### ELECTRICAL

It is considered that this vessel was too far from the center of the blast to experience damage in this test.

V. Any preliminary General or Specific Recommendations.

### HULL

Light sheet metal structures such as flag bags and gear lockers should be eliminated and the facilities built into the deckhouse proper.

### MACHINERY

None.

### ELECTRICAL

None.

SECRET

USS GASCONADE (APA85)

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test: list; general areas of flooding, sources.

Drafts before Test A: Forward 11' 6"; Aft 17' 0";  
List 1° Port.

There is a reported increase in the draft aft of 6" and an increase in the port list to 2°. This may have been caused by leakage in the port shaft alley. However, inspection of the ship revealed no flooding.

##### (b) Structural damage.

#### HULL

There is no structural damage, however exposed sheet metal is slightly damaged.

#### MACHINERY

No comment.

#### ELECTRICAL

Not observed.

##### (c) Other damage.

#### HULL

No comment.

SECRET

USS GENEVA (APA86)

## **MACHINERY**

None. All machinery was operated after Test A, and functioned normally.

## **ELECTRICAL**

There was no damage to electrical equipment.

## **II. Forces Evidenced and Effects Noted.**

### **(a) Heat.**

## **HULL**

Heat radiation caused slight blistering and scorching of paint on vertical surfaces normal to the burst. Jute lines, cargo nets, and canvas are slightly scorched.

## **MACHINERY**

No evidence.

## **ELECTRICAL**

None observed in the way of electrical equipment.

### **(b) Fires and explosions.**

## **HULL**

There were no explosions. The only fire burned a jute cargo net which was hanging over the side at frame 40, port.

## **MACHINERY**

No evidence.

**SECRET**

**USS GENEVA (APA86)**



## ELECTRICAL

There were no fires or explosions in the way of electrical equipment.

(c) Shock.

## HULL

None.

## MACHINERY

No evidence.

## ELECTRICAL

There was no evidence of shock damage to electrical equipment.

(d) Pressure.

## HULL

Blast caused dishing of light plating, tearing of canvas and shattering of glass.

## MACHINERY

No evidence.

## ELECTRICAL

There was no evidence of pressure damage to electrical equipment.

(e) Effects peculiar to the Atom Bomb.

## HULL

None.

SECRET

USS GENEVA (APA86)

**MACHINERY**

No evidence.

**ELECTRICAL**

No effects peculiar to the atom bomb were noted.

**III. Effects of Damage.**

**(a) Effect on machinery, electrical, and ship control.**

**HULL**

None.

**MACHINERY**

None.

**ELECTRICAL**

No effect on electrical equipment or ship control from  
Test A.

**(b) Effect on gunnery and fire control.**

**HULL**

None.

**MACHINERY**

No comment.

**ELECTRICAL**

No effect.

**SECRET**

**USS GENEVA (APA86)**

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No effect.

(d) Effect on personnel and habitability.

HULL

Exposed personnel might have been burned. Habitability is not affected.

MACHINERY

None.

ELECTRICAL

Habitability of the vessel was not affected from electrical damage.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

SECRET

USS GENEVA (APA86)

**ELECTRICAL**

There was no effect on the fighting efficiency of the vessel from electrical damage.

**IV. General Summary of Observers' Impressions and Conclusions.**

**HULL**

No comment.

**MACHINERY**

The GENEVA was outside the effective range of the explosion in Test A.

**ELECTRICAL**

There being only very minor damage, no conclusions were made by the observers.

**V. Preliminary General or Specific Recommendation of the Inspecting Group.**

**HULL**

None.

**MACHINERY**

None.

**ELECTRICAL**

None.

**SECRET**

**USS GENEVA (APA86)**

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; list; general areas of flooding, sources.

There is no flooding, hence no change in drafts or list.

##### (b) Structural damage.

#### HULL

There is no major structural damage. The port flag bag is slightly dished.

#### MACHINERY

No comment.

#### ELECTRICAL

1. Structural damage was negligible. The port flag bag was slightly dished and approximately 10% of the hatch boards on upper deck of both cargo holds were dislodged and fell to deck below.

2. The above damage had no effect on any electrical equipment.

##### (c) Other damage.

#### HULL

Not observed.

#### MACHINERY

There is no damage to the machinery of this vessel, all of which has been operated since Test A.

SECRET

U.S.S. NIAGARA (APA87)

## ELECTRICAL

1. Close visual inspection revealed no damage to any electrical equipment or electrical elements of ship control, fire control and gunnery as a direct result of the bomb blast. Practically all of the above equipment has been operated since A day and in every case found satisfactory.

2. Secondary cable damage due to fire in oil soaked fender located at frame 115 main deck port rendered one lighting receptacle, one telephone jack box and one-four gang push button inoperable.

## II. Forces Evidenced and Effects Noted.

(a) Heat.

## HULL

Manila line was slightly scorched. No paint was scorched by direct heat radiation.

## MACHINERY

No evidence.

## ELECTRICAL

1. Radiant heat coming from port quarter slightly scorched Army quartermaster gear displayed on forecastle and is believed to have started oil soaked fender smouldering on main deck at frame 115, port.

2. There was no damage to any electrical equipment as a result of heat other than secondary cable damage previously mentioned.

(b) Fires and explosion.

## HULL

A fire started in an oil soaked fender made of cocoa matting

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U.S.S. NIAGARA (APA87)

which was secured to the longitudinal bulkhead at frame 113, port, main deck. The fire ignited wooden shores stowed overhead and burned the paint from nearby areas on the bulkhead and upper deck. There were no explosions.

#### MACHINERY

No evidence.

#### ELECTRICAL

1. One small fire occurred on board this vessel as a direct result of the bomb. Resulting cable damage described in I (c) 2.

2. There were no explosions.

(c) Shock.

#### HULL

While there was no damage from shock, some of the sections of the upper deck cargo hatch covers were dislodged and fell into the space below.

#### MACHINERY

No evidence.

#### ELECTRICAL

There was no damage to any electrical equipment as a result of shock.

(d) Pressure.

#### HULL

The only damage caused by pressure was slight dishing of the port flag bag which was fabricated from sheet metal, and

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U.S.S. NIAGARA (APA 87)

breakage of several glasscovers over magazine sprinkling valves at weather deck operating stations.

#### MACHINERY

No evidence.

#### ELECTRICAL

1. The only evidence of pressure was dishing of port flag bag.
  2. There was no electrical damage as a result of pressure.
- (e) Effects peculiar to the Atomic Bomb.

#### HULL

None.

#### MACHINERY

None.

#### ELECTRICAL

Radioactivity and radiant heat were the only effect observed that are apparently peculiar to the Atom Bomb. Neither of these caused any material damage to electrical equipment.

### III. Results of Test on Target.

- (a) Effect on machinery, electrical, and ship control.

#### HULL

Not observed.

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MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None. There was no impairment of structural strength or seaworthiness.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Insofar as hull structure is concerned, there is no effect on habitability. Topside personnel might have suffered slight burns.

MACHINERY

None.

ELECTRICAL

1. Personnel manning exposed topside stations would probably have suffered minor flash burns and temporary blindness as a result of the radiant heat and light. Injuries resulting from the blast pressure wave would be relatively light, possibly a few bruises.

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U.S.S. NIAGARA (APA 87)

2. Other than the effect of radioactivity, habitability has in no way been affected by this test.

(e) Effect on fighting efficiency.

#### HULL

Damage to this ship was superficial, although there might have been some casualties among topside personnel, the vessel would have been able to fulfill its mission.

#### MACHINERY

None.

#### ELECTRICAL

The fighting efficiency of this vessel has not been reduced as a result of any electrical damage.

#### IV. General Summary of Observers' Impressions and Conclusions.

##### HULL

None.

##### MACHINERY

The NIAGARA was outside the effective range of the explosion during Test A.

##### ELECTRICAL

The location of this vessel in the target array was outside the effective range of the bomb. There was no electrical damage except for minor secondary damage due to fire previously mentioned. Had a crew been on board at time of blast, this fire would have been quickly extinguished and the resulting electrical damage nil.

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U.S.S. NIAGARA (APA 87)

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

SECRET

U.S.S. NIAGARA (APA 87)

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## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target condition after test.

##### (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

#### HULL

The elevator is badly distorted as the result of air blast and can not be operated. There is minor dishing of the shell plating and deck house bulkhead on the starboard side.

#### MAC HINERY

Blast pressure tore one of the cables away from the elevator platform. This makes the elevator inoperable, although its machinery is undamaged.

#### ELECTRICAL

No damage to electrical equipment occurred due to structural damage.

##### (c) Other damage.

#### HULL

Not observed

#### MACHINERY

There was no damage to machinery of this vessel during test A.

SECRET

USS LST 52

## ELECTRICAL

1. No electrical damage to machinery occurred.
2. No electrical damage to ship control occurred other than that the starboard running and range lights were inoperable.

## II. Forces evidenced and effects noted.

- (a) Heat.

### HULL

Heat started one fire and scorched a canvas awning on the port quarter and paint on vertical surfaces normal to the burst.

### MACHINERY

No evidence.

### ELECTRICAL

No electrical damage due to heat was noted.

- (b) Fires and explosions.

### HULL

The only fire burned a bag of 105 mm powder. There were no explosions.

### MACHINERY

No evidence

### ELECTRICAL

No electrical damage due to fire or explosions occurred.

SECRET

USS LST 52

(c) Shock.

HULL

Several light bulbs were broken. A porcelain wash basin was shaken from the bulkhead.

MACHINERY

No evidence.

ELECTRICAL

Shock caused a small number of filaments in light bulbs to break and caused pulling out of screw holding a light fixture in the wardroom.

(d) Pressure.

HULL

Air pressure caused deflection of the starboard bulkhead of the deck house and the starboard shell plating. Light topside equipment is damaged. The elevator platform was pushed down from the main deck securing devices.

MACHINERY

Blast pressure tore loose one of the cables of the tank deck elevator and broke loose heavy scale in the evaporators and some of the piping.

ELECTRICAL

Pressure or blast caused the starboard running light to be blown overboard and the range light to be blown down. Also caused cracked glasses on the 12" searchlights, port and starboard.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

SECRET

USS LST 52

## MACHINERY

Blast pressure sufficient to have any noticeable effect at this distance from an explosion is apparently peculiar to the Atom Bomb.

## ELECTRICAL

Radio activation was the only peculiar action noted to the atomic bomb.

### III. Results of test on target.

- (a) Effect on machinery, electrical, and ship control.

## HULL

Not observed.

## MACHINERY

None. The tank deck elevator is inoperable because of the breaking of one of its hoisting cables, but the machinery is undamaged. It is estimated that this condition could be remedied by the ship's force within 4 hours.

## ELECTRICAL

No effect was noted due to electrical damage.

- (b) Effect on gunnery and fire control.

## HULL

Not observed.

## MACHINERY

No comment.

SECRET

USS LST 52

## ELECTRICAL

No effect occurred due to electrical damage.

(c) Effect on watertight integrity and stability.

## HULL

None.

## MACHINERY

No comment.

## ELECTRICAL

No effect occurred due to electrical damage.

(d) Effect on personnel and habitability.

## HULL

Personnel would have been affected by heat, blast, and radioactivity. Habitability is not affected.

## MACHINERY

Personnel below decks would not have been affected by test A. Habitability was not affected.

## ELECTRICAL

No effect occurred due to electrical damage.

(e) Effect on fighting efficiency.

## HULL

Fighting efficiency is decreased by failure of the elevator which would prevent the landing of equipment stowed on the main deck.

SECRET

USS LST 52



## MACHINERY

The tank deck elevator was made temporarily inoperable. It is estimated that it could be made operable by the ship's force within 4 hours. The test had no other effect on fighting efficiency as far as machinery is concerned.

## ELECTRICAL

No effect occurred due to electrical damage.

### IV. Summary of Observers' Impressions and Conclusions.

## HULL

This vessel, except for the elevator, behaved in a very satisfactory manner.

## MACHINERY

LST 52 was outside the range of serious damage from the explosion during test A.

## ELECTRICAL

At the distance of this vessel from the center of the blast, the effects of the bomb are very slight on electrical equipment. Such effects as were observed can be easily neutralized by changes in design or arrangement.

### V. Preliminary recommendations.

## HULL

Study should be given to the design of all types of elevators. These behaved poorly during the test.

## MACHINERY

None.

## ELECTRICAL

It is suggested the running lights be set in and streamlined to the superstructure as protection from the blast.

SECRET

USS LST 52

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, list, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural Damage.

###### HULL

None.

###### MACHINERY

No comment.

###### ELECTRICAL

There was no structural damage in way of electrical equipment.

##### (c) Other damage.

###### HULL

Not observed.

###### MACHINERY

The machinery of this vessel was not damaged by Test A. The vessel shifted berths under her own power after Test A, at which time all machinery was tested.

###### ELECTRICAL

No damage occurred to electrical equipment due to Test A.

SECRET

USS LST 220

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

#### HULL

Heat emanated from a relative bearing of 120 degrees. Paint was scorched only in small local areas where it had been thickly applied. Manila lines made up on the starboard lifeline are generally scorched. Two fires started in manila line.

#### MACHINERY

No evidence.

#### ELECTRICAL

No evidence of heat in way of electrical equipment.

### (b) Fires and Explosions.

#### HULL

A manila line made up on the lifeline at frame 11, starboard, burned. Two wash deck hoses stowed at frame 88, starboard, on the after bulkhead of the deck house, burned completely. This fire ignited and completely destroyed the contents of an adjacent gear locker. Paint in the area is badly burned.

#### MACHINERY

No evidence.

#### ELECTRICAL

There was no fires or explosions in way of electrical equipment.

### (c) Shock.

SECRET

USS LST 220

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock in way of electrical equipment.

(d) Pressure.

HULL

Soot was blown from ventilation ducts and there was some elastic deflection of the main deck.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure in way of electrical equipment.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None.

SECRET

USS LST 220

## ELECTRICAL

Radiant heat was evident on exposed surfaces. No other effect peculiar to the Atom Bomb was noted. The radiant heat had no apparent effect on any electrical equipment.

### III. Results of Test on Target.

#### (a) Effect on machinery, electrical, and ship control.

##### HULL

Not observed.

##### MACHINERY

None.

##### ELECTRICAL

No damage was apparent to electrical machinery or ship control.

#### (b) Effect on gunnery and fire control.

##### HULL

Not observed.

##### MACHINERY

No comment.

##### ELECTRICAL

No damage was apparent.

#### (c) Effect on watertight integrity and stability.

SECRET

USS LST 220

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No electrical damage affected watertight integrity or stability.

(d) Effect on personnel and habitability.

HULL

Exposed personnel would probably have been injured by heat and radiation. Habitability is not affected.

MACHINERY

None.

ELECTRICAL

No electrical damage affected personnel or habitability.

(e) Effect on fighting efficiency.

HULL

Other than possible injury of exposed personnel, there would have been no effect on fighting efficiency.

MACHINERY

None.

ELECTRICAL

No electrical damage affected the fighting efficiency of the vessel.

SECRET

USS LST 220

IV. Summary of Observer's Impressions and Conclusions.

HULL

No comment.

MACHINERY

LST 220 was outside the effective range of the explosion during Test A.

ELECTRICAL

No damage was evident on any electrical equipment on this vessel. It appears that the effects of the Atom Bomb at the distance of this vessel from the center of the blast are not such as to require special designs or installation arrangements for electrical equipment.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

SECRET

USS LST 220

# TECHNICAL INSPECTION REPORT

## OVERALL SUMMARY

### I. Target Condition After Test.

#### (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts  
or list.

#### (b) Structural damage.

##### HULL

None.

##### MACHINERY

No comment.

##### ELECTRICAL

There was no structural damage in way of  
electrical equipment.

#### (c) Other damage.

##### HULL

Not observed.

##### MACHINERY

None.

##### ELECTRICAL

No damage occurred to electrical equipment due  
to test A.

SECRET

USS LST 545



II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat in way of electrical equipment.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There were no fires or explosions in way of electrical equipment.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

SECRET

USS LST 545

## ELECTRICAL

There was no evidence of shock in way of electrical equipment.

(d) Pressure.

## HULL

The only evidence of pressure is that dirt inside ventilation ducts was loosened and collected in the cheese cloth screens at the duct terminals.

## MACHINERY

No evidence.

## ELECTRICAL

There was no evidence of pressure in way of electrical equipment.

(e) Effects peculiar to the atomic bomb.

## HULL

None.

## MACHINERY

None.

## ELECTRICAL

Electrical equipment showed no evidence of damage peculiar to the atom bomb.

### III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

## HULL

Not observed.

SECRET

USS LST 545

## MACHINERY

None. The vessel shifted berths under her own power after test A. At this time all machinery was tested except for a few units that were inoperable before test A. Performance was normal.

## ELECTRICAL

No damage was apparent to electrical machinery or ship control.

(b) Effect on gunnery and fire control.

## HULL

None.

## MACHINERY

No comment.

## ELECTRICAL

No damage was apparent.

(c) Effect on watertight integrity and stability.

## HULL

None.

## MACHINERY

No comment.

## ELECTRICAL

No electrical damage affected watertight integrity or stability.

SECRET

USS LST 545

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None.

ELECTRICAL

No electrical damage affected personnel or habitability.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

No electrical damage affected the fighting efficiency of the vessel.

IV. Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

LST 545 was outside the effective range of the explosion in test A.

SECRET

USS LST 545

ELECTRICAL

No damage occurred to any electrical equipment on this vessel due to the test.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

SECRET

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USS LST 545

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

(a) Drafts after test, list, general areas of flooding, sources.

list. There was no flooding, hence no change in drafts or

(b) Structural Damage.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

equipment. There was no structural damage in way of electrical

(c) Other Damage.

HULL

Not observed.

MACHINERY

None.

ELECTRICAL

Test A. No damage occurred to electrical equipment due to

SECRET

USS LST 661

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

Heat caused some scorching of paint on the starboard side. Two fires were ignited.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of damage to electrical equipment due to heat.

(b) Fires and Explosions.

HULL

One fire burned two life rafts, main deck, frame 20, port. A second fire started in a cane fender resting on the main deck cargo hatch cover. It burned part of the fireproofed canvas tarpaulin and part of the wood hatch boards. Embers from this fire fell to the tank deck. They ignited wood boxes and canvas tarpaulins stowed there. The gear on the tank deck is nearly completely burned. Paint on adjacent surfaces is burned and blackened.

MACHINERY

No evidence.

ELECTRICAL

There was no damage to electrical equipment due to fires or explosions.

SECRET

USS LST 661

(c) Shock.

HULL

The only evidences of shock are that a porcelain wash basin was jarred loose and some of the cover boards of the cargo hatch are displaced.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock in way of electrical equipment.

(d) Pressure.

HULL

The only observed effect of pressure are the slight dishing of a 40MM ready service locker on the fantail and the tearing loose of about 1/4 of the rigged awnings.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure in way of electrical equipment.

(e) Effects peculiar to the Atomic Bomb.

HULL

Radioactivity and intense heat are the only effects noted which are peculiar to the Atom Bomb.

MACHINERY

None.

~~ELECTRICAL~~

SECRET

USS LST 661



There was no effect peculiar to the Atom Bomb noted in way of electrical equipment.

III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

HULL

Not observed.

MACHINERY

None. The ship operated at full power after Test A. All machinery functioned normally.

ELECTRICAL

No damage occurred to electrical machinery or ship control.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

There was no damage affecting gunnery or fire control.

(c) Effect on watertight integrity and stability.

HULL

None.

SECRET

USS LST 661

MACHINERY

No comment.

ELECTRICAL

There was no electrical damage affecting watertight integrity or stability.

(d) Effect on personnel and habitability.

HULL

Exposed personnel would have been affected by the heat and radioactivity. Habitability is not affected.

MACHINERY

None.

ELECTRICAL

No electrical damage affected personnel or habitability.

(e) Effect on fighting efficiency.

HULL

Fighting efficiency would have been affected only by the possible injury of personnel.

MACHINERY

None.

ELECTRICAL

No electrical damage affected the fighting efficiency

SECRET

USS LST 661)

IV. Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

LST 661 was outside the effective range of the explosion during Test A.

ELECTRICAL

No damage was apparent to any electrical equipment on this vessel due to test A. It appears that present designs of electrical equipment are sufficiently rugged to withstand conditions existing on this vessel at the time of the blast.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None

SECRET

USS LST 661

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

None.

##### (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

##### (a) Heat.

Heat has caused slight blistering of paint on surfaces directly exposed.

##### (b) Fires and explosions.

None.

##### (c) Shock.

None.

##### (d) Pressure.

Blast has caused slight dishing of light plating on hatch companionways and damage to sun shields on ready service boxes. A few awning stanchions have carried away.

SECRET

USS LCI 327

(e) Effects apparently peculiar to the atom bomb.

None.

### III. Effects of Damage.

(a) Effect on machinery, electrical, and ship control.

The test had no effect on the machinery of this vessel. All machinery that was operable before Test A was operated after the test, and functioned normally. Damage to electrical equipment had no effect on ship control. There is no electric propulsion on the vessel.

(b) Effect on gunnery and fire control.

Damage to electrical equipment had no effect on gunnery or on fire control.

(c) Effect on water-tight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Total effect on fighting efficiency.

None.

### IV. General Summary of Observers' Impressions and Conclusions.

This vessel was outside the effective range of the explosion during Test A.

### V. Preliminary General or Specific Recommendations of Inspection Group.

None.

SECRET

USS LCI 327

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

- (a) Drafts after test; list; general areas of flooding, sources.

There is no flooding, hence no change in drafts or list.

- (b) Structural damage.

The galley smoke pipe, which was badly rusted prior to the test, is torn loose from its base.

- (c) Other damage.

None.

#### II. Effects Evidenced and Effects Noted.

- (a) Heat.

There is slight scorching of some lines and the yoke flag.

- (b) Fires and explosions.

None.

- (c) Shock.

None.

- (d) Pressure.

None.

- (e) Effects peculiar to the atomic bomb.

None.

SECRET

USS LCI 329

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

- (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

- (b) Structural damage.

None.

- (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

- (a) Heat.

The paint on surfaces which were approximately normal to the burst was slightly scorched.

- (b) Fires and explosions.

One halyard burned and ignited a canvas flag bag cover and a pillow, and scorched a wooden mast at the cleat to which it was secured.

- (c) Shock.

None.

- (d) Pressure.

The light plating around the forward and after companionway hatches is slightly dished. A locker was blown off of an exposed bulkhead. Pipe supports for awnings were bent. A small piece of wood was blown out of the mast.

SECRET

USS LCI 332

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

- (a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

- (b) Structural damage.

None.

- (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

- (a) Heat.

The paint on surfaces which were approximately normal to the burst was slightly scorched.

- (b) Fires and explosions.

One halyard burned and ignited a canvas flag bag cover and a pillow, and scorched a wooden mast at the cleat to which it was secured.

- (c) Shock.

None.

- (d) Pressure.

The light plating around the forward and after companionway hatches is slightly dished. A locker was blown off of an exposed bulkhead. Pipe supports for awnings were bent. A small piece of wood was blown out of the mast.

SECRET

USS LCI 332



(e) Effects apparently peculiar to the atom bomb.

None.

### III. Results of Test on Target.

(a) Effect on machinery, electrical and ship control.

The test had no effect on the machinery of this vessel. All machinery that was operable before test A was operated after the test and functioned normally. There was no electrical damage to affect ship control. The vessel does not have electric propulsion.

(b) Effect on gunnery and fire control.

There was no damage to electrical equipment to have effect on gunnery and fire control.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

Exposed personnel would probably have suffered flash burns. Habitability was not affected.

(e) Effect on fighting efficiency.

None.

### IV. General Summary.

This vessel was outside the effective range of the explosion during test A.

### V. Recommendations.

None.

SECRET

USS LCI 332

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; list; general areas of flooding, sources.

list. There was no flooding, hence no change in drafts or

##### (b) Structural damage.

No damage.

##### (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

##### (a) Heat.

None.

##### (b) Fires and explosions.

None.

##### (c) Shock.

None.

##### (d) Pressure.

None.

##### (e) Effects peculiar to the atomic bomb.

None.

SECRET

USS LCI 549

### III. Results of Test on Target.

- (a) Effect on machinery, electrical, and ship control.

#### MACHINERY

The test had no effect on the machinery of this vessel. All machinery that was operable before test A was operated after the test, and functioned normally. There was no effect on ship control. The vessel does not have electric propulsion.

- (b) Effect on gunnery and fire control.

There was no effect on gunnery and fire control.

- (c) Effect on watertight integrity and stability.

None.

- (d) Effect on personnel and habitability.

None.

- (e) Effect on fighting efficiency.

None.

### IV. General Summary.

This vessel was outside the effective range of the explosion during test A.

### V. Recommendations.

None.

SECRET

USS LCI 549

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

- (a) Drafts after test; list; general areas of flooding, sources.

list. There was no flooding, hence no change in drafts or

- (b) Structural damage.

No damage.

- (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

- (a) Heat.

None.

- (b) Fires and explosions.

None.

- (c) Shock.

None.

- (d) Pressure.

None.

- (e) Effects peculiar to the atomic bomb.

None.

SECRET

USS LCI 649

### III. Results of Test on Target.

- (a) Effect on machinery, electrical, and ship control.

#### MACHINERY

The test had no effect on the machinery of this vessel. All machinery that was operable before test A was operated after the test, and functioned normally. There was no effect on ship control. The vessel does not have electric propulsion.

- (b) Effect on gunnery and fire control.

There was no effect on gunnery and fire control.

- (c) Effect on watertight integrity and stability.

None.

- (d) Effect on personnel and habitability.

None.

- (e) Effect on fighting efficiency.

None.

### IV. General Summary.

This vessel was outside the effective range of the explosion during test A.

### V. Recommendations.

None.

SECRET

USS LCI 549

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

No damage.

##### (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

##### (a) Heat.

None.

##### (b) Fires and explosions.

None.

##### (c) Shock.

None.

##### (d) Pressure.

None.

SECRET

USS LCT 705

(e) Effects peculiar to the Atom Bomb.

None.

### III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

None, as far as can be determined from visual inspection.

(b) Effect on gunnery and fire control.

Gunnery and fire control were unaffected electrically.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

### IV. General Summary.

The distance of this vessel from the blast was too great for damage to occur.

### V. Preliminary Recommendations.

None.

SECRET

USS LCT 705

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list. There was a small amount of minor seepage through the steam tubes

##### (b) Structural Damage.

Damage to this craft consists of dishing of bulkheads exposed to the blast and moderate fire damage. The mast caught fire, burned through about three feet below the yardarm, and fell down alongside the pilot house.

##### (c) Other Damage.

There was no crew aboard and no power available for operating machinery. However, except for two shattered light bulbs and the damage caused by the fire, the electrical and machinery equipment suffered no apparent damage. The exhaust fan in the galley overhead, a blower motor for the galley range and one galley light were inoperable due to damage to their cables from the heat of the fire.

#### II. Forces evidenced and effects noted.

##### (a) Heat.

Heat scorched paint to a depth of one coat and blistered vertical surfaces facing aft. Lines were scorched.

##### (b) Fires and Explosions.

The wooden mast is almost completely burned off just below the yardarm. A fire on the port quarter burned the contents of some open cans of paint, a wooden plank, and some cable insulation. This fire warped a section of the after bulkhead of the galley and caused severe scorching of paint in the galley.

SECRET

USS LCT816



(c) Shock.

None.

(d) Pressure.

Damage due to blast is confined to the slight dish-  
ing of exposed bulkheads and the severe distortion of the angle fram-  
ing of the flagbag. The critical weight of plating appears to be 10#  
M.S.

(e) Effects peculiar to the Atomic Bomb.

None.

### III. Effects of Damage.

(a) Effect on machinery, electrical, and ship control.

None.

(b) Effect on gunnery and fire control.

None.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

Exposed personnel would most likely have suffered  
from flash burns. Habitability is unimpaired.

(e) Effect on fighting efficiency.

None.

### IV. General Summary of Observers' Impressions and Conclusions.

SECRET

This vessel was outside the effective range of the  
USS LCT816

explosion in Test A.

V. Preliminary General or Specific Recommendations of  
Inspection Group.

Inflammable materials should be stowed in sheltered  
locations or otherwise protected against direct exposure to the radiant  
heat of the blast.

SECRET

USS LCT816

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

Structural damage is negligible. The flag bag is dished. Screens in a few ventilation system are torn loose.

##### (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

##### (a) Heat.

Normal to the blast, some paint is slightly scorched. Some lines are slightly scorched.

##### (b) Fires and explosions.

None.

##### (c) Shock.

None.

SECRET

USS LCT 818

(d) Pressure.

Pressures of low intensity are indicated by dishing of the flag bag and screens in the ventilation system.

(e) Effects peculiar to the Atom Bomb.

None.

III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

No apparent effect.

(b) Effect on gunnery and fire control.

None.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

IV. General Summary.

This vessel was outside the effective range of the explosion in Test A.

V. Preliminary Recommendations.

None.

SECRET

USS LCT 818

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; general areas of flooding.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

No damage.

##### (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

##### (a) Heat.

None.

##### (b) Fires and explosions.

None.

##### (c) Shock.

None.

##### (d) Pressure.

None.

SECRET

USS LCT 874

(e) Effects peculiar to the Atom Bomb.

None.

### III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

None.

(b) Effect on gunnery and fire control.

None.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

### IV. General Summary.

This vessel was outside the effective range of the explosion in Test A.

### V. Preliminary Recommendations.

None.

SECRET

USS LCT 874

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test; general areas of flooding, sources.

The engine room spaces flooded to a depth of 6 inches through the stern tubes which were leaking before the test. There is no appreciable change in draft, list or trim.

##### (b) Structural damage.

No damage.

##### (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

##### (a) Heat.

None.

##### (b) Fires and explosions.

None.

##### (c) Shock.

None.

##### (d) Pressure.

None.

SECRET

USS LCT 1013

(e) Effects peculiar to the Atom Bomb,

None.

### III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

None.

(b) Effect on gunnery and fire control.

None.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

### IV. General Summary.

This vessel was outside the effective range of the explosion in Test A.

### V. Preliminary Recommendations.

None.

SECRET

USS LCT 1013



## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding.

There was no flooding, hence no change in draft or list.

##### (b) Structural damage.

The mast is broken just above the diagonal braces and the starboard yardarm is broken off.

##### (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

##### (a) Heat.

None.

##### (b) Fires and explosions.

None.

##### (c) Shock.

None.

##### (d) Pressure.

Blast pressure caused displacement of the flag bag and was probably responsible for the mast and yardarm damage. Soot was blown from ducts into the galley and nearby living spaces.

SECRET

USS LCT 1078

(e) Effects peculiar to the Atom Bomb.

None.

### III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

None.

(b) Effect on gunnery and fire control.

None.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

### IV. General Summary.

This vessel was outside the effective range of the explosion in Test A.

### V. Preliminary Recommendations.

None.

SECRET

USS LCT 1078

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

No damage.

##### (c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

##### (a) Heat.

None.

##### (b) Fires and explosions.

None.

##### (c) Shock.

None.

##### (d) Pressure.

None.

SECRET

USS LCT 1112

(e) Effects peculiar to the Atom Bomb.

None.

### III. Results of Test on Target.

(a) Effect on machinery, electrical, and ship control.

None.

(b) Effect on gunnery and fire control.

None.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

### IV. General Summary.

This vessel was outside the effective range of the explosion in Test A.

### V. Preliminary Recommendations.

None.

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USS LCT 1112

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

(a) Drafts after test, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

(b) Structural damage.

No damage.

(c) Other damage.

None.

#### II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

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USS LCT 1113

(e) Effects peculiar to the Atom Bomb.

None.

### III. Results of Test on Target.

(a) Effects on machinery, electrical, and ship control.

None.

(b) Effect on gunnery and fire control.

None.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

### IV. General Summary.

This vessel was outside the effective range of the explosion in Test A.

### V. Preliminary Recommendations.

None.

SECRET

USS LCT 1113

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources.

No draft marks are fitted. Some flooding has occurred through the stern tubes which were leaking before the test. Although the craft was afloat the day after the test when inspected, three days later she was floating with four feet of the bow ramp out of water.

##### (b) Structural Damage.

The bow ramp was blown open. The ramp cables and special chain lashings which were installed for the test parted. The deck over the engine compartment is dished about two inches. The bulwarks around the conning station and those outboard of the tank well are slightly deflected.

##### (c) Other damage.

There was no damage to machinery during Test A except for flooding. All electrical equipment on the vessel was rendered inoperable by flooding. Storage batteries were partly dislodged from their racks.

#### II. Forces evidenced and effects noted.

##### (a) Heat.

Paint on deck was slightly scorched and blistered.

##### (b) Fires and Explosions.

None.

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USS LCM-1

(c) Shock.

Shock effect was noted by storage batteries partly dislodged from their racks.

(d) Pressure.

Air blast blew open the bow ramp and caused deflection of topside bulwarks and the deck above the engine compartment.

(e) Effects peculiar to the Atomic Bomb.

None.

III. Effects of Damage.

(a) Effect on machinery, electrical, and ship control.

The deflection of the deck above the engine compartment caused misalignment of the steering mechanism which now operates with considerable difficulty.

(b) Effect on gunnery and fire control.

Not applicable.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

Personnel aboard would probably have been injured or killed by blast and heat.

(e) Effect on fighting efficiency.

Fighting efficiency is decreased by failure of the bow ramp securing mechanism.

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USS LCM-1



## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources.

No draft marks are fitted. Some flooding has occurred through the stern tubes which were leaking before the test. Although the craft was afloat the day after the test when inspected, three days later she was floating with four feet of the bow ramp out of water.

##### (b) Structural Damage.

The bow ramp was blown open. The ramp cables and special chain lashings which were installed for the test parted. The deck over the engine compartment is dished about two inches. The bulwarks around the conning station and those outboard of the tank well are slightly deflected.

##### (c) Other damage.

There was no damage to machinery during Test A except for flooding. All electrical equipment on the vessel was rendered inoperable by flooding. Storage batteries were partly dislodged from their racks.

#### II. Forces evidenced and effects noted.

##### (a) Heat.

Paint on deck was slightly scorched and blistered.

##### (b) Fires and Explosions.

None.

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USS LCM-1

(c) Shock.

Shock effect was noted by storage batteries partly dislodged from their racks.

(d) Pressure.

Air blast blew open the bow ramp and caused deflection of topside bulwarks and the deck above the engine compartment.

(e) Effects peculiar to the Atomic Bomb.

None.

III. Effects of Damage.

(a) Effect on machinery, electrical, and ship control.

The deflection of the deck above the engine compartment caused misalignment of the steering mechanism which now operates with considerable difficulty.

(b) Effect on gunnery and fire control.

Not applicable.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

Personnel aboard would probably have been injured or killed by blast and heat.

(e) Effect on fighting efficiency.

Fighting efficiency is decreased by failure of the bow ramp securing mechanism.

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USS LCM-1

IV. General Summary of Observers' Impressions and Conclusions.

This craft stood up very well considering the proximity to the burst.

V. Preliminary General or Specific Recommendations of Inspection Group.

Provision should be made for a more adequate securing device for the bow ramp.

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USS LCM-1

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

I. The following landing craft were beached on Bikini Island during Test A:

LST 133  
LCI 615, 620  
LCT 414, 812, 1175, 1237  
LCM 2, 3, 4, 5, 6  
LCVP 7, 8, 9, 10, 11, 12

The larger craft (LST's, LCI's and LCT's) were beached approximately midway between the limits of high and low tide and were secured with bow lines to objects on the beach and with stern anchors. The smaller craft (LSM's and LCVP's) were pulled up on the beach just above the high water mark by tractors to prevent their displacement by tidal or wave action.

2. The following landing craft were unaffected as a direct result of test A:

LST 133  
LCI 620  
LCI 812, 1175  
LCM 2, 3, 4, 5, 6  
LCVP 7, 8, 9, 10, 11, 12

3. The damaged landing craft fall into three general categories as follows:

(a) Craft exhibiting minor effects of air blast:

LCI 615  
LCI 414, 1237

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BEACHED LANDING CRAFT

(b) Craft damaged and flooded as a result of contact with coral ledges during the unattended period following the test:

LCI 615  
LCT 812, 1175

(c) Craft damaged by jarring, abrasion, or rupture as a result of handling on the beach by tractors:

LCM 6  
LCVP 9, 10, 11

4. Blast pressure was slight, caused no structural damage, and was limited to such effects as tearing of canvas and blowing of soot out of a galley range. No heat or shock effects resulted from the test. No machinery was damaged except by corrosion incident to flooding of engine spaces.

There was no impairment of watertight integrity as a direct result of the test. However, several craft which were not drawn up on the beach above the high water mark were punctured by continued pounding against coral ledges. Damage from contact with coral was cumulative over an unattended period of twelve days between the time of the test and the date of inspection. A general condition of leaky propeller shaft stuffing glands contributed to flooding of engine spaces.

In view of the disadvantageous beaching conditions on Bikini, it is considered that the landing craft withstood the unattended period very well. As far as the direct results of test A are concerned, damage to the craft beached on Bikini is essentially nonexistent. Fighting efficiency was not affected and ability of the craft to engage in beaching operations is unimpaired.

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BEACHED LANDING CRAFT

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources,

There was no flooding, hence no change in drafts or list.

##### (b) Structural damage.

#### HULL

The structure above the main deck is almost completely demolished. There is no significant damage below the main deck.

#### MACHINERY

No comment.

#### ELECTRICAL

This vessel received extensive structural damage on the main deck and above. The wooden bridge house and all equipment therein burned. Concrete deck houses had their bulkheads and overheads blown in. The wooden catwalk was demolished. This structural damage caused damage to electrical equipment mounted on or near the structure affected.

##### (c) Other damage.

#### HULL

Not observed.

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USS YO160

## MACHINERY

Nearly all of the machinery was wrecked by direct effect of the blast on exposed machinery, and heavy concrete blocks forming the overhead of machinery spaces. This concrete was broken loose by the blast and fell onto the machinery.

## ELECTRICAL

Practically all electrical equipment on this vessel was destroyed either by the fire or by the damage to structures. Ship's service diesel generator plant and all power and lighting circuits were damaged beyond repair. Motors and motor controllers were all wrecked beyond repair with the possible exception of the anchor windlass motor and master switch. Practically all lighting fixtures and lamps were demolished. Sound powered telephone circuits and most telephone equipment destroyed. Except for the breakage of indicator lights, the overflow fuel oil alarm indicating system appeared to be undamaged and capable of being operated if power was available.

## II. Forces Evidenced and Effects Noted.

### (a) Heat.

## HULL

There is little evidence of heat other than that which caused the wooden bridge house and the compartments below to burn. Wood planking on the catwalk showed no charring.

## MACHINERY

The outside forward bulkhead of the poop deckhouse shows evidence of extreme heat and fire. Scorched and blistered paint on exposed surfaces evidence extreme heat from the direction of the blast.

## ELECTRICAL

Radiant heat from above and aft was evidenced by the  
USS YO160

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scorching of exposed surfaces. This radiant heat did no apparent damage directly to electrical equipment. It is considered, however, that this radiant heat started the fires on the vessel.

(b) Fires and Explosions.

HULL

Fire completely burned the wooden bridge house and burned out the interior of several compartments below the poop deck. There were no explosions.

MACHINERY

The poop deckhouse was gutted by fire.

ELECTRICAL

The radiant heat started a fire aft which burned practically all inflammable material and equipment aft on the main deck and above. The areas burned included the vessels living and berthing spaces, steering engine room, engine room, wooden bridge and part of the catwalk. It is estimated that approximately 90% of the electrical equipment in these areas was destroyed by the fire. The equipment in which the original fire started is not evident since the entire area is so badly burned.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was some evidence of shock to electrical

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equipment. This shock is considered to be mostly a secondary effect. It caused equipment mounted on structures to become missiles. When these missiles struck other equipment or structures the impact caused damage to the equipment hit or to equipment mounted on the structures. Effects of apparent shock were noted in broken phenolic parts of switches and cracked or broken cast iron parts.

(d) Pressure.

HULL

There is no pressure damage to the hull proper. Concrete superstructure which was badly damaged by blast has spalled and exposed the steel reinforcements. Items of equipment were, in general, damaged and torn loose from their moorings. In many cases the moorings tore away from the concrete.

MACHINERY

Very high blast pressure from starboard wrecked all exposed equipment and carried away some of it. The blast broke loose the thick concrete on the decks and overheads and it fell into spaces below, completely wrecking them.

ELECTRICAL

Air blast from above and aft is considered to be the primary cause of damage to this vessel. Even though the fire caused extensive damage, much of the equipment that was burned had previously been damaged by the blast. The blast in carrying away structures damaged the electrical equipment mounted on these structures.

(e) Effects peculiar to the Atom Bomb.

HULL

None.

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## MACHINERY

The high blast pressure and extreme heat are apparently peculiar to the Atom Bomb.

## ELECTRICAL

There were no effects noted that are considered peculiar to the Atomic Bomb other than radioactivity and the intensity of the heat wave.

### III. Results of Test on Target.

#### (a) Effect on machinery, electrical, and ship control.

## HULL

The steering mechanism is operable but can be controlled only in the steering compartments.

## MACHINERY

All machinery except the anchor windlass was completely wrecked and is considered to be beyond repair.

## ELECTRICAL

The electric plant was almost completely destroyed. Almost all electrical equipment was damaged beyond practical repair. Ship's control was destroyed.

#### (b) Effect on gunnery and fire control.

## HULL

The 20 MM gun foundations and bulwarks are useless.

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## MACHINERY

No comment.

## ELECTRICAL

All gunnery and fire control was destroyed.

(c) Effect on watertight integrity and stability.

## HULL

None.

## MACHINERY

No comment.

## ELECTRICAL

No comment.

(d) Effect on personnel and habitability.

## HULL

Casualties to topside personnel from blast, heat, and radioactivity would have been extremely heavy. The test has rendered the craft uninhabitable.

## MACHINERY

It is believed that if the crew had been aboard during the test all of them would have been killed. Habitability was reduced to practically zero.

## ELECTRICAL

The effects of radioactivity on personnel and habitability are not known. Neglecting radioactivity there would have

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USS YO160

been very heavy personnel casualties due to the air blast, radiant heat and missiles. The ship was not habitable since all berthing and messing facilities were destroyed by fire.

(e) Effect on fighting efficiency.

HULL

There is no impairment of seaworthiness. However, the serviceability is practically destroyed by damage to the boiler and pump room equipment. The 20 MM gun foundations have been blown down so that if guns had been installed, they also would have been put out of action.

MACHINERY

The ability of the vessel to deliver fuel or lubricants is destroyed. Her capability as a storage tank does not appear to have been seriously impaired.

NOTE: This vessel has no propulsion machinery.

ELECTRICAL

This vessel could not perform its primary function which is handling its cargo of fuel oil. From an electrical standpoint the fighting efficiency of the vessel was zero.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

The services of this vessel would be entirely lost until either permanent or jury rig machinery could be installed for handling the cargo.

For further information see the detailed report prepared by the Bureau of Yards and Docks.

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## MACHINERY

In view of this vessel's close range during Test A her survival is noteworthy. Protected machinery might have remained operable if the decks and overheads of machinery spaces had been steel instead of concrete.

## ELECTRICAL

While electrical equipment was almost entirely destroyed by this test, most of the electrical damage was of a secondary nature having been caused by missiles due to concrete structures giving away and due to fires.

- V. Preliminary General or Specific Recommendations of Inspection Group.

## HULL

None.

## MACHINERY

If additional concrete vessels are to be built, consideration should be given to use of steel for decks and overheads.

## ELECTRICAL

None.

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USS YO160

## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

##### (a) Drafts after test, general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

##### (b) Structural Damage.

#### HULL

The top of the concrete pump room house amidships has two transverse cracks approximately one foot away from each bounding transverse bulkhead and a longitudinal crack at midlength near the port edge. The three transverse beams below the deck have cracked near the splays with the vertical house side frames.

The wooden wheel house is intact but is displaced forward and to port. The wooden sides around the tank below the pilot house were blown down.

Miscellaneous light topside equipment has been blown from its foundations. The foremast is blown down and the flag pole on the poop deck is bent to port.

#### MACHINERY

The vent pipe to the after peak tank was bent to port about 15 degrees at the point where it rises above the main deck. The wire cable of the steering gear from the pilot house was tightened by movement to port of the pilot house .

#### ELECTRICAL

Wiring, fixtures and indicating instruments in pilot house structure and on mast were damaged due to distortion and

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USS YOG83

splintering of wooden bulkheads and breakage of the wooden mast. Structural damage was caused by blast pressure.

(c) Other damage.

#### HULL

Not observed.

#### MACHINERY

The inlet pipe of the starboard generator engine was bent and ruptured near its upper end. This pipe was exposed to blast pressure. It had been greatly weakened by corrosion before Test A. There is no other damage to machinery.

#### ELECTRICAL

Electrical damage was confined to wiring and fixtures in way of structural damage to pilot house, bridge and masts.

II. Forces evidenced and effects noted.

(a) Heat.

#### HULL

There is rather heavy blistering and scorching of paint, especially on wooden surfaces.

#### MACHINERY

Paint on vertical surfaces facing the explosion is scorched.

#### ELECTRICAL

Heat was indicated by scorched paint on exposed surfaces and scorched insulation on exposed wiring. Scorching occurred over the entire length of the vessel on the starboard side and on

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the after side of exposed thwartship bulkheads. Penetration was through the equivalent of one coat of paint. Vertical surfaces were scorched over the entire surface. Horizontal surfaces were scorched only near the starboard edge and on projections or humps on the horizontal surfaces.

(b) Fires and Explosions.

HULL

Two bags of 155 MM powder and a box of dynamite caps which were exposed on the main deck, burned.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of fires or explosions in way of electrical equipment.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock in way of electrical equipment.

(d) Pressure.

HULL

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Practically all damage on this craft is attributable to the blast . It consisted of cracks in the concrete pump house amidships, moderate damage to the wooden wheel house and distortion and displacement of light structures, such as vent covers, spud locker, gun shields and rigging.

#### MACHINERY

Blast pressure pushed the wooden pilot house to port, tightened the steering control cable, and damaged the (already badly corroded) starboard engine muffler. The blast came from starboard.

#### ELECTRICAL

Pressure was evidenced by the forcing of the pilot house structure to port and forward and the wrecking of the wooden bulkheads of the pilot house structure. A negative pressure was indicated above the pilot house by the lifting off of the wooden roof of the pilot house without much disturbance to the sheathing underneath.

(e) Effects peculiar to the Atomic Bomb.

#### HULL

None.

#### MACHINERY

Blast pressure and heat of such intensity are apparently peculiar to the Atom Bomb.

#### ELECTRICAL

Evidence of extreme heat in open spaces without combustion is an effect apparently peculiar to the Atom Bomb.

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III. Results of Test on Target.

(a) Effect on machinery, electrical and ship control.

HULL

Not observed.

MACHINERY

The test had no appreciable effect on machinery or ship control. The steering cable could be easily adjusted. Damage to the generator muffler was negligible and would not have occurred if the muffler had been in good condition. Machinery operable before the test was operated after it.

ELECTRICAL

Steering gear wire control from pilot house was out of adjustment due to the distortion of the wood structure from which it was supported. No other damage was apparent to electrical machinery or ship control.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

No electrical damage affected gunnery or fire control.

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(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No electrical damage affected watertight integrity or stability.

(d) Effect on personnel and habitability.

HULL

Exposed personnel would probably have been casualties from the blast, flash burns, or radioactivity. The habitability of the craft is not affected.

MACHINERY

It is estimated that the test would have had no effect on personnel in protected locations, but that those exposed (including those in the wooden pilot house) would have been casualties. Habitability was not affected.

ELECTRICAL

No electrical damage affected personnel or habitability.

(e) Effect on fighting efficiency.

HULL

None.

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## MACHINERY

The efficiency of the vessel as a fuel barge was not impaired.

NOTE: This vessel has no propulsion machinery.

## ELECTRICAL

Fighting efficiency was slightly reduced due to damage to steering control from the pilot house.

### IV. General Summary of Observers' Impressions and Conclusions.

## HULL

Additional information regarding this barge is included in the Bureau of Yards and Docks Report.

## MACHINERY

YOG 83 was apparently a short distance outside the limit of serious damage to vessels of her type during Test A.

## ELECTRICAL

Electrical damage was superficial and easily repairable by the ship's force. Running lights and signal lights were the only items damaged.

### V. Preliminary General or Specific Recommendations of Inspection Group.

## HULL

None.

## MACHINERY

The flimsy wooden pilot house is inconsistent with the construction of the remainder of the vessel, and should be replaced

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by a stronger one.

ELECTRICAL

None.

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## TECHNICAL INSPECTION REPORT

### OVERALL SUMMARY

#### I. Target Condition After Test.

- (a) Drafts after test; list; general areas of flooding, sources.

The drafts are reported as follows:

	Draft forward	Draft aft	List
Before Test A.	9'-6"	9'-6"	0°
After Test A.	10'-5" (port)	12'-0" (port)	0°-41 (port)
	9'-5" (stbd)	10'-0" (stbd)	Trim by stern 0°-16'

As a result of a structural longitudinal crack in the port slab just below the waterline, there is a gradual seepage into three of the port tanks and the after peak tank. The draft readings after the test given above are for the period 1500, 2 July, and represent approximately 30 hours of slow flooding. The average draft at 1500 on 4 July was 13.2 feet and the list was about 8 degrees, 10 minutes to port. Water was washing through the dock on the port side. C deck, port wing, was flooded by water entering an open ventilation duct.

Areas of flooding: Numbers 2, 4, 6, and 8 main tanks, after peak tank and "C" deck in port wingwall, to approximately 7 feet above deck level.

Sources: Small crack along port wingwall just below the waterline and minor crack in bottom of number 6 and 8 main tanks.

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(b) Structural damage.

HULL

The port wing wall has suffered the most damage. The exterior face is charred and the heavy timber fender work is lightly charred. Topside fittings show the effects of the blast attack. A machinery hatch on the port wingwall at A-deck level is carried away. The mushroom-type ventilators are intact, life lines are down, light standards are broken or badly bent. The port and starboard catwalks overhanging the dock floor at A-deck level are destroyed.

The major damage appears in the form of longitudinal, tensile cracks in the concrete slabs of both wingwalls, A-deck, B-deck in the port wingwall, the framing system in the port wall between A and B decks, and along the dock floor. The concrete is spalled in some places on the frames and the reinforcing bars are exposed. The port slab is cracked, longitudinally, just below the waterline, frames 18 to 55. This crack is open over about one-fourth of its length and has allowed the flooding of port side tanks 4, 6, and 8, and the after peak tank. These structural cracks are of significance only where the crack is open sufficiently to allow seepage from one watertight sub-division to another.

MACHINERY

No comment.

ELECTRICAL

The control house located on "A" deck, top of starboard wingwall was completely destroyed by blast pressure. Had the electrical equipment associated with docking control been installed it would have been carried away with this structure.

Structural failure of port wingwall caused secondary damage to motors and controllers for fresh water pumps, sanitary pumps, portable welding generator and refrigeration compressors located on port "C" deck due to flooding of this area.

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(c) Other damage.

#### HULL

The main engines for power and light are undamaged. The flooding in way of the port tanks has caused the loss of all pumps controlling fresh water and the sanitary system. The refrigeration space is flooded. There is no other significant damage to equipment.

#### MACHINERY

Refrigerating equipment, and fresh and salt water pumps on C deck, port wing, were damaged by flooding. Two ventilation blowers (crew's head and captain's stateroom) were damaged by blast pressure entering the open vent ducts.

#### ELECTRICAL

The two main diesel driven generators, distribution switchboard, power and lighting distribution panels and diesel engine auxiliaries located on "C" deck in starboard wing-wall were undamaged and operable. Secondary damage due to flooding of power and lighting distribution panels, motors and motor controllers for fresh and salt water pumps, air compressors, refrigeration compressors and portable welding generator located on "C" deck in port wingwall rendered these systems inoperable.

The electrical equipment associated with docking control suffered only minor damage. Due to the drydock being approximately 60% complete only a small amount of this equipment was installed.

Fire control and gunnery are not applicable as this dock has no armament.

#### II. Forces Evident and Effects Noted.

(a) Heat.

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## HULL

The port faces of both wingwalls are darkened and the port side fenders are charred to a depth of about 1/16 inch. The shadow effects indicate that the heat emanated from a source on a relative bearing of 280 degrees.

## MACHINERY

Paint on exposed deck machinery was scorched and blistered.

## ELECTRICAL

This drydock was subjected to a wave of radiant heat coming from approximately 12 degrees forward of the port beam and 4 degrees elevation of sufficient intensity to char exposed woodwork to a depth of 1/16 inch. However, this caused no damage to any electrical equipment.

(b) Fires and explosions.

## HULL

A small section of the creosote-treated timbers that form the framework of the catwalks is burned. This section is in the forward face of the port wingwall. There is no other evidence of fire and there were no explosions.

## MACHINERY

No evidence.

## ELECTRICAL

There were no fires or explosions.

(c) Shock.

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## HULL

The shock had no significant effect upon the dock.

## MACHINERY

No evidence.

## ELECTRICAL

There was no evidence of damage to any electrical equipment as a result of shock.

(d) Pressure.

## HULL

The pressure wave apparently originated at a point nearly broad on the port beam. The effect of the pressure was to strain the wingwalls, A deck, port B deck, and the dock floor sufficiently to open hairline cracks, for the most part, throughout the length of the dock. A few of the cracks are well defined. The concrete framing, especially in the port wall shows signs of transverse racking strains, with fairly well defined cracks and some spalling of concrete. The wingwalls were exposed internally to the blast as well as externally through several non-airtight accesses on A deck level, such as the damaged main engine room access and several mushroom ventilators. The blast has damaged joiner work in the interior and created further failures in decks and the wingwall. The effects of diffraction and reflection must also be considered as contributing to the damage to the inboard slabs of the wingwalls.

## MACHINERY

Blast pressure entering open ventilation ducts wrecked the ventilation set in the crew's shower, and damaged the casing of the ventilation set in the Captain's stateroom.

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## ELECTRICAL

This drydock was subjected to a pressure wave coming from approximately 12 degrees forward of the port beam of sufficient magnitude to crack the port wingwall, carry away control house and deflect 2-1/2 inch pipe stanchions on which capstan control switches were mounted.

Pressure entering port and starboard "B" decks through open ventilation systems, generally dislodged equipment in crew's berthing and messing spaces, galley, laundry and sick bay areas.

(e) Any effects apparently peculiar to the Atomic Bomb.

## HULL

Disregarding radioactivity, the intense heat radiation was the only effect peculiar to the Atom Bomb.

## MACHINERY

None.

## ELECTRICAL

Radiant heat and blast pressure..

### III. Results of Damage.

Effect on machinery, electrical and ship control.

## HULL

There is very little machinery or electrical equipment installed and the dock is designed to be towed. There is no significant damage to any of these items.

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## MACHINERY

Refrigerating equipment and water pumps are inoperable from flooding. One ventilation set (crew's shower) is out of commission. None of this damage would have occurred if the ventilation ducts had been closed. However, it should be noted that these ventilation systems are normally open during operations of the vessel.

## ELECTRICAL

The main diesel generator plant, distribution switchboard, power and lighting distribution system and diesel engine auxiliaries located on the starboard wingwall were undamaged and operable. The secondary damage due to flooding of motor operated pumps and compressors, their controls and regulating equipment as noted in paragraph I rendered them inoperable. However, this flooding could have been easily controlled had the dewatering system been installed and a damage control party able to operate.

The loss of the control house which normally houses docking control and communications center, would seriously impair the efficient operation of this dock. However, by means of jury rig telephones and local operation of pumps and valves this dock could continue to function in emergencies.

(b) Effect on gunnery and fire control.

## HULL

No comment.

## MACHINERY

No comment.

## ELECTRICAL

This drydock has no armament.

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(c) Effect on watertight integrity.

HULL

The watertight integrity is impaired by cracks in the concrete shell and in some of the concrete watertight bulkheads. However, any leakage through the cracks may be easily controlled by portable submersible pumps, providing that the dock can be manned.

MACHINERY

No comment.

ELECTRICAL

All personnel stationed on topside would have suffered casualties as a result of radiant heat and bomb blast pressure.

The habitability of the dry dock has been impaired due to flooding of "C" deck in port wingwall, rendering the fresh water pumps, sanitary pumps, and refrigeration machinery inoperable. However, had the de-watering system been installed and operable, the flooding could have been easily controlled. Blast damage in crew's messing and berthing spaces was such as to render them not livable without repairs, all of which were within the capacity of the docks force.

(d) Effect on personnel and habitability.

HULL

The habitability of the ship is impaired to a slight degree by the flooding of pump rooms. Had the dock been manned and equipped, the flooding could have been prevented.

MACHINERY

It is not believed that there would have been any personnel casualties below decks. Habitability is adversely affected

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by loss of refrigeration and of fresh and salt water service.

#### ELECTRICAL

No comment.

(e) Total effect on fighting efficiency.

#### HULL

The cracks in the concrete are not believed to materially affect the longitudinal strength of the vessel. The seepage through the port slab is well within the capacity of the ship's pumps.

#### MACHINERY

None, except for adverse effect on habitability (see III (c) above).

Note this vessel is not self-propelled.

#### ELECTRICAL

This drydock has no armament. Its efficiency as a drydock has been considerably reduced from an electrical view-point due to the loss of the control house, which if completed would have housed the necessary controls and communications for operation of the dock.

#### IV. General Summary of Observers' Impressions and Conclusions.

##### HULL

No comment.

##### MACHINERY

The ventilation ducts left open inadvertently on this vessel give an indication of what might occur on other vessels.

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(notably destroyers) with low ventilation intakes or exhausts, if exposed to attacks of this nature during normal operation.

#### ELECTRICAL

This drydock was subjected to a flash of radiant heat, followed by an air blast pressure of considerable magnitude. Due to the nearness of this dock to the center of the blast, damage received is not unusual considering that rendered to other vessels in the same proximity. The electrical damage suffered by this dock is well within the capacity of the forces afloat to repair. Had a complete crew been onboard and the de-watering system been installed the flooding could have been controlled and electrical equipment on "C" deck in port wingwall would not have been impaired. It is the opinion of the observer that had the electrical installation been complete very little additional damage would have resulted, except for the electrical equipment housed in the control house which would have been completely destroyed.

#### V. Preliminary Recommendations.

##### HULL

None.

##### MACHINERY

Provision should be made for preventing damage to machinery from water entering through a vent duct, in cases where such ducts are low.

##### ELECTRICAL

None.

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Classification (Cancelled) (Changed to \_\_\_\_\_)  
By Authority of JOINT CHIEFS OF STAFF JCS 1795/36 DATED 15 APRIL 1949  
By John G. Kelly, Maj, ARDC Date JUN 28 1949

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SPECIAL REQUESTED DATA CLEARANCE NOTIFICATION  
USE ALL INFORMATION FOR SECURITY



TRC

**Defense Special Weapons Agency**  
6801 Telegraph Road  
Alexandria, Virginia 22310-3398

10 April 1997

MEMORANDUM FOR DEFENSE TECHNICAL INFORMATION CENTER  
ATTENTION: OMI/Mr. William Bush

SUBJECT: Declassification of Reports

The Defense Special Weapons Agency (formerly Defense Nuclear Agency) Security Office has reviewed and declassified the following reports:

AD-366718✓	XRD-32-Volume 3	
AD-366726✓	XRD-12-Volume 2	
AD-366703✓	XRD-16-Volume 1	
AD-366702✓	XRD-14-Volume 2	
AD-376819L✓	XRD-17-Volume 2	
AD-366704✓	XRD-18	
AD-367451✓	XRD-19-Volume 1	
AD-366700 <sup>05</sup> ✓	XRD-20-Volume 2	AD-366705
AD-376028L✓	XRD-4	
AD-366694✓	XRD-1	
AD-473912✓	XRD-193	
AD-473891✓	XRD-171	
AD-473899✓	XRD-163	
AD-473887✓	XRD-166	
AD-473888✓	XRD-167	ST-A 28 JAN 80 made target
AD-473889✓	XRD-168	



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SUBJECT: Declassification of Reports

AD-B197749	XRD-174
AD-473905	XRD-182
AD-366719	XRD-33 Volume 4
AD-366700	XRD-10
AD-366712	XRD-25 Volume 1
AD-376827L	XRD-75
AD-366756	XRD-73
AD-366757	XRD-74
AD-366755	XRD-72
AD-366754	XRD-71
AD-366710	XRD-23 Volume 1
AD-366711	XRD-24 Volume 2
AD-366753	XRD-70
AD-366749	XRD-66
AD-366701	XRD-11
AD-366745	XRD-62.

All of the cited reports are now **approved for public release; distribution statement "A" applies.**

*Arduith Jarrett*  
ARDITH JARRETT  
Chief, Technical Resource Center

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*Completed*

*L.W*